PSYCHIATRIC TREATMENT

RESEARCH PUBLICATIONS

ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASE

World List Abbreviations: Res. Publ. Assoc. Nerv. Ment. Dis.

VOLUME XXXI

Editorial Committee:

S. Bernard Wortis, M.D., *Chairman*

Morris Herman, M.D.

Clarence C. Hare, M.D.

A list of the previous issues in the Series of Research Publications will be found on verso of title page

PSYCHIATRIC TREATMENT

PROCEEDINGS OF THE ASSOCIATION
December 14 and 15, 1951
New York, N. Y.

WITH 49 ILLUSTRATIONS
AND 62 TABLES

Bureau Ednl. Research
Dated 15 3. 56
Acc. No 981

BALTIMORE
THE WILLIAMS & WILKINS COMPANY
1953

Copyright 1953
Association for Research in Nervous and Mental Disease

Printed in the United States of America

RESEARCH PUBLICATIONS

I. (1920) *Acute Epidemic Encephalitis (Lethargic Encephalitis)
II. (1921) *Multiple Sclerosis (Disseminated Sclerosis)
III. (1923) *Heredity in Nervous and Mental Disease
IV. (1924) *The Human Cerebrospinal Fluid
V. (1925) *Schizophrenia (Dementia Praecox)
VI. (1926) *The Cerebellum
VII. (1922) *Epilepsy and the Convulsive State (Part I)
(1929) *Epilepsy and the Convulsive State (Part II)
VIII. (1927) *The Intracranial Pressure in Health and Disease
IX. (1928) *The Vegetative Nervous System
X. (1929) *Schizophrenia (Dementia Praecox) (Continuation of Vol. V)
XI. (1930) *Manic-Depressive Psychosis
XII. (1931) *Infections of the Central Nervous System
XIII. (1932) *Localization of Function in the Cerebral Cortex
XIV. (1933) *The Biology of the Individual
XV. (1934) *Sensation: Its Mechanisms and Disturbances
XVI. (1935) *Tumors of the Nervous System
XVII. (1936) *The Pituitary Gland
XVIII. (1937) *The Circulation of the Brain and Spinal Cord
XIX. (1938) *The Inter-relationship of Mind and Body
XX. (1939) *The Hypothalamus and Central Levels of Autonomic Function
XXI. (1940) *The Disease of the Basal Ganglia
XXII. (1941) *The Role of Nutritional Deficiency in Nervous and Mental Disease
XXIII. (1942) Pain
XXIV. (1943) *Trauma of the Central Nervous System
XXV. (1946) Military Neuropsychiatry
XXVI. (1947) *Epilepsy
XXVII. (1947) The Frontal Lobes
XXVIII. (1948) Multiple Sclerosis and the Demyelinating Diseases
XXIX. (1949) Life Stress and Bodily Disease
XXX. (1950) Patterns of Organization in the Central Nervous System
XXXI. (1951) Psychiatric Treatment

*Out of print not for sale.

Printed at the Waverly Press, Inc., Baltimore 2, Md., U. S. A.

OFFICERS

S. Bernard Wortis, M.D.
President
410 East 57th Street
New York 22, N. Y.

John C. Whitehorn, M.D.
Vice-President
Johns Hopkins Hospital
Baltimore 5, Md.

J. Lawrence Pool, M.D.
Vice-President
700 West 168th Street
New York 32, N. Y.

Clarence C. Hare, M.D.
Secretary-Treasurer
700 West 168th Street
New York 32, N. Y.

Rollo J. Masselink, M.D.
Assistant Secretary
Neurological Institute
700 West 168th Street
New York 32, N. Y.

TRUSTEES

S. Bernard Wortis, M.D., *Chairman*
New York

Henry Alsop Riley, M.D.
New York

Walter Timme, M.D.
New York

Edwin G. Zabriskie, M.D.
New York

Foster Kennedy, M.D.
New York

COMMISSION, 1951

S. Bernard Wortis, M.D., *Chairman*
New York

Franz Alexander, M.D.
Chicago, Ill.

Kenneth Appel, M.D.
Philadelphia, Pa.

Francis J. Braceland, M.D.
Hartford, Conn.

D. Ewen Cameron, M.D.
Montreal, Canada

Oskar Diethelm, M.D.
New York, N. Y.

John C. Eberhart, Ph.D.
Bethesda, Md.

Jerome D. Frank, M.D.
Baltimore, Md.

Robert G. Heath, M.D.
New Orleans, La.

Morris Herman, M.D.
New York, N. Y.

Paul H. Hoch, M.D.
New York, N. Y.

Lothar B. Kalinowsky, M.D.
New York, N. Y.

Maurice Levine, M.D.
Cincinnati, Ohio

David M. Levy, M.D.
New York, N. Y.

Wendell Muncie, M.D.
Baltimore, Md.

J. Lawrence Pool, M.D.
New York, N. Y.

Sandor Rado, M.D.
New York, N. Y.

George N. Raines, M.D.
Chevy Chase, Md.

John Romano, M.D.
Rochester, N. Y.

Jurgen Ruesch, M.D.
San Francisco, Cal.

Harry C. Solomon, M.D.
Boston, Mass.

A. Earl Walker, M.D.
Baltimore, Md.

John C. Whitehorn, M.D.
Baltimore, Md.

PROGRAM COMMITTEE

S. Bernard Wortis, M.D., *Chairman*
New York

John C. Eberhart, Ph.D.
Bethesda, Md.

Morris Herman, M.D.
New York, N. Y.

J. Lawrence Pool, M.D.
New York, N. Y.

John C. Whitehorn, M.D.
Baltimore, Md.

CONTRIBUTORS TO VOLUME XXXI

ALEXANDER, FRANZ, M.D., Clinical Professor of Psychiatry, University of Illinois; Clinical Professor of Psychiatry, Illinois Neuro-psychiatric Institute, Chicago, Illinois.

APPEL, KENNETH E., A.B., A.M., Ph.D., M.D., Sc.D. (Hon.), Professor of Psychiatry, University of Pennsylvania; Director of Clinic for Functional Diseases, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.

BAILEY, PERCIVAL, M.D., Ph.D., Distinguished Professor of Neurology and Neurological Surgery; Clinical Professor of Psychiatry, University of Illinois, Chicago; Director of the Illinois State Psychopathic Institute.

BERLE, BEATRICE, A.B., A.M., M.D., Assistant Professor of Clinical Public Health and Preventive Medicine, Cornell University Medical College; Physician OPD, The New York Hospital, New York City.

BONNER, FRANCES J., A.B., M.D., Assistant in Psychiatry, Harvard University Medical School; Assistant in Psychiatry, Massachusetts General Hospital, Boston, Massachusetts.

DIETHELM, OSKAR, Staats Examen. Zurich, 1922, M.D., Berne, 1923; Professor of Psychiatry, Cornell University Medical College; Psychiatrist-in-Chief, New York Hospital, New York City.

FRANK, JEROME D., Ph.D., M.D., Associate Professor of Psychiatry, Johns Hopkins University; Psychiatrist-in-Charge, Psychiatric Outpatient Department, Johns Hopkins Hospital, Baltimore, Maryland.

FREED, HERBERT, M.D., Assistant Professor of Psychiatry, Temple University Medical School; Visiting Chief of Psychopathic Department, Chief of Child Psychiatry Division, Philadelphia General Hospital, Philadelphia, Pennsylvania.

FUNKENSTEIN, DANIEL H., A.B., M.D., Instructor in Psychiatry, Harvard Medical School; Senior Psychiatrist, Boston Psychopathic Hospital, Boston, Massachusetts.

GARDNER, GEORGE E., Ph.D., M.D., Lecturer, Department of Social Relations, Harvard University; Associate Professor of Psychiatry, Boston University School of Medicine; Director, Judge Baker Guidance Center, Boston, Massachusetts.

GIBBS, FREDERIC A., M.D., Professor of Neurology, University of Illinois School of Medicine, Chicago, Illinois.

GREEN, JOHN R., B.S., M.D., Director, Neurosurgical Unit, Arizona State Hospital; Consulting Neuro-surgeon, Veterans Administration Hospital, Phoenix; Army Air Force, Williams Field, Chandler, Arizona; Active Staff, Good Samaritan, St. Joseph's, Memorial Hospitals, Phoenix, Arizona.

GREENBLATT, MILTON, A.B., M.D., Associate in Psychiatry, Harvard Medical School; Chief of Laboratories and Research, Boston Psychopathic Hospital, Boston, Massachusetts.

HADDEN, SAMUEL B., M.D., Assistant Professor, Department of Psychiatry, School of Medicine, University of Pennsylvania; Chief of Neuropsychiatric Service, The Presbyterian Hospital, Philadelphia, Pennsylvania.

HARVEY, WILLIAM A., A.B., M.D., Associate in Psychiatry, University of Pennsylvania School of Medicine; Educational Director, Institute of the Pennsylvania Hospital, Philadelphia, Pennsylvania.

HENRY, CHARLES E., Ph.D., Director, Psychophysiological Laboratories, Institute of Living, Hartford, Connecticut.

HIGGINS, JOHN W., A.B., M.D., Instructor in Psychiatry, College of Medicine, University of Cincinnati; Assistant Attending Psychiatrist, Cincinnati General Hospital, Cincinnati, Ohio.

HOCH, PAUL H., M.D., Associate Professor of Psychiatry, College of Physicians and Surgeons,

Columbia University; Principal Research Psychiatrist, New York State Psychiatric Institute, New York City.

HOLSOPPLE, JAMES Q., A.B., A.M., Ph.D., Department of Medicine and Surgery, Division Psychiatry and Neurology, Veterans Administration, Washington, D. C.

HUGHES, JOSEPH, A.B., M.D., Professor of Psychiatry, Woman's Medical College of Pennsylvania; Psychiatrist, Institute of Pennsylvania Hospital, Philadelphia, Pennsylvania.

JACKMAN, ABRAHAM I., B.S., M.S., M.D., F.A.P.A., Chicago, Ill.

JENKINS, RICHARD L., B.A., M.D., Chief Research Section, Psychiatry and Neurology Division, Veterans Administration, Washington, D. C.

KALINOWSKY, LOTHAR B., M.D., Research Associate in Psychiatry, Columbia University; Associate Attending Neurologist, Neurological Institute, New York City.

LHAMON, W. T., A.B., M.D., Associate Professor of Psychiatry, University of Pennsylvania; Hospital, University of Pennsylvania; Philadelphia, Pennsylvania.

LIBERSON, W. T., M.D., Ph.D., Professor of Clinical Neurophysiology, University of Connecticut; Director of EEG Laboratory and Consultant Neurophysiologist, Hartford Hospital, Hartford, Connecticut.

LIDZ, THEODORE, B.A., M.D. Professor of Psychiatry, Yale University; Psychiatrist-in-Chief of the University Service of the Grace-New Haven Community Hospital, New Haven, Connecticut.

LIVINGSTON, KENNETH E., A.B., M.D., Instructor in Surgery, University of Oregon Medical School; Consultant in Neurosurgery, USVAH, Portland, Oregon; USVAH, Roseburg, Oregon.

MEDUNA, LADISLAS J., M.D., Professor of Psychiatry, University of Illinois; Assistant Neuropsychiatrist, St. Luke's Hospital, Chicago, Illinois.

MERRITT, H. HOUSTON, A.B., M.D., M.A., Professor of Neurology, College of Physicians and Surgeons, Columbia University; Director of the Service of Neurology, Neurological Institute-Presbyterian Hospital, New York.

MUNCIE, WENDELL, B.S., M.D., Psychiatrist, Johns Hopkins Hospital; Associate Professor of Psychiatry, Johns Hopkins University, Baltimore, Maryland.

MYERS, J. MARTIN, A.B., M.D., Associate in Psychiatry, University of Pennsylvania School of Medicine; Executive Medical Officer, Department of Nervous and Mental Diseases, Pennsylvania Hospital, Philadelphia, Pennsylvania.

ORCHINIK, CARLTON W., M.A., Psychologist, Temple University Hospital and School of Medicine, Philadelphia, Pennsylvania.

PEPE, ANTHONY JAMES, B.S., M.D., Surgeon, Norwich State Hospital, Norwich, Connecticut.

PINSKY, RUTH H., B.A., M.A., Research Assistant, Cornell University Medical College, New York City.

POWERS, EDWIN, A.B., M.A., LL.B., Visiting Lecturer, Harvard University.

RADO, SANDOR, M.D., D.P.Sc., Clinical Professor of Psychiatry, Columbia University; Director, Psychoanalytic Clinic for Training and Research, New York City.

REISER, MORTON F., B.S., M.D., Assistant Professor of Psychiatry and Medicine, University of Cincinnati College of Medicine; Attending Physician, Psychiatry Clinician, Psychiatric Clinic; Clinician, Clinical Physiology Clinic, Division of Medicine, Cincinnati, Ohio.

RIOCH, DAVID MCK., A.B., M.D., Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C.

ROGERS, CARL R., M.A., Ph.D., Professor of Psychology, University of Chicago, Chicago, Illinois.

ROME, HOWARD PHILLIPS, M.D., Associate Professor of Psychiatry, Graduate School of Medicine, University of Minnesota; Consultant in Psychiatry, Mayo Clinic, Rochester, Minnesota.

ROSENBAUM, MILTON, B.S., M.D., Professor of Psychiatry, University of Cincinnati College of Medicine; Associate Director of Psychiatric Department, Cincinnati General Hospital, Cincinnati, Ohio.

RUESCH, JURGEN, M.D., Associate Professor of Psychiatry, University of California School of Medicine; Research Psychiatrist, The Langley Porter Clinic, San Francisco, California.

SCHNECK, JEROME M., A.B., M.D., Clinical Associate in Psychiatry, State University of New York; Psychiatric Consultant, Westchester County Department of Health.

SCOVILLE, W. B., B.A., M.D., Associate Clinical Professor of Surgery (Neurosurgery), Yale University; Neurosurgeon, Hartford Hospital; Neurosurgical Consultant, Institute of Living, Hartford, Connecticut.

SHERFEY, MARY JANE, A.B., M.D., Instructor, Cornell University College of Medicine; Admitting Physician, Psychiatric Out-Patient Department, New York Hospital, New York City.

SOLOMON, HARRY C., A.B., M.D., Professor of Psychiatry, Harvard Medical School; Medical Director, Boston Psychopathic Hospital, Boston, Massachusetts.

SPIEGEL, ERNEST, M.D., Professor of Experimental and Applied Neurology, Head of the Department of Experimental Neurology, Temple University School of Medicine and Hospital, Philadelphia, Pennsylvania.

STANTON, ALFRED H., A.B., M.D., Fellow, Washington School of Psychiatry; Cushing VA Hospital, Framingham, Massachusetts.

TEUBER, HANS-LUKAS, Ph.D., Assistant Professor of Experimental Psychology, New York University College of Medicine; Area Consultant, United States Veterans Administration, New York City.

WHITEHORN, JOHN C., A.B., M.D., Professor of Psychiatry and Director of the Department of Psychiatry, Johns Hopkins University; Psychiatrist-in-chief, Johns Hopkins Hospital, Baltimore, Maryland.

WILLIAMS, JONATHAN M., M.D., Associate in Neurosurgery, George Washington University; Attending Neurosurgeon, George Washington University Hospital, Washington, D. C.

WOLF, STEWART, A.B., M.D., Professor and Head of Department of Medicine, University of Oklahoma Medical School; Physician-in-chief, University Hospital, Oklahoma City, Oklahoma.

ZUBIN, JOSEPH, A.B., Ph.D., Visiting Professor of Psychology, Columbia University; Associate Research Psychologist, New York State Psychiatric Institute and Hospital, New York City.

PREFACE

To maintain healthy growth every science must keep abreast of developments in the fields that impinge upon it. This is particularly true of the applied science of Medicine which needs continually to re-examine its basic data. Psychiatry, a relatively young and rapidly growing branch of the applied science of Medicine, must also be guided by this principle. Failure to do so may lead to dogmatic rigidity and inaccuracy.

Modern treatment in psychiatry covers a wide range of procedures—psychological, social, pharmacological, electrical and neurosurgical. In planning this symposium, the Program Committee attempted to bring together a group of workers who have been specially interested in evaluating the effectiveness of different treatment procedures. In this field, concerned with personality disorders and mental illness, we are urgently in need of accurate evaluation studies of the different therapeutic modalities; for too often claims are made for the effectiveness of a specific treatment without our having sufficient basic knowledge of the "life history" of an illness.

During the past 20 years, psychiatric treatment has developed along many lines. Pharmacological, electrical and other somatic procedures have become well established. Progress has been made in experimenting with group psychotherapy and modifications of individual psychotherapeutic procedures; both giving us better understanding of the dynamics of interpersonal reactions. Moreover, it has become generally accepted that therapy must be directed not only towards the individual but must encompass also his family and social environment.

Accompanying all these advances, we have had too few critical evaluations of the effectiveness of treatment. This symposium is an attempt to survey the different psychiatric therapies as to their basic factors, methods, and utility.

In order to organize the conference concisely, the program was arranged so that the first day's meeting included Individual and Group Psychotherapeutic Procedures; the second meeting day considered Electrophysiological, Pharmacological and Neurosurgical treatment methods.

In order to achieve more effective consideration of the subject matter of the symposium, specific members of the Commission were assigned to open the discussion of a group of related papers. Following this, the discussion was carried on by other members of the Association. It was the Program Committee's belief that this form of organized survey and discussion of a group of papers would more clearly bring the problems into focus.

The symposium presented some of the strengths, weaknesses and omissions in present-day psychiatric treatment. A survey of the reports indicates that the therapist should be humble in claims made for the exclusive

effectiveness of any one treatment procedure, or for any one factor influencing treatment in psychiatry. It would also appear, as one looks over the data of the course of personality illness and the effectiveness of various therapeutic procedures, that approximately one-third of the patients do not respond to treatment, one-third get well with treatment and one-third may be influenced to a greater or lesser degree by treatment. We have only meagre information concerning what happens to patients who are not treated. Such studies pose the problem of the underlying psychosociobiological factors that make for responsiveness to treatment methods.

We hope this volume will serve as a stimulus to further studies along these lines. Like Antaeus who renewed his strength whenever he touched Earth, Psychiatry likewise will renew its strength by a return to the basic soil of scientific critical evaluation.

S. Bernard Wortis, M.D.

CONTENTS

INDIVIDUAL AND GROUP PSYCHOTHERAPY

SECTION I

I. Therapeutic Goals and Their Significance for Therapeutic Strategy. *John C. Whitehorn* 3
II. Design for the Evaluation of Therapy. *Joseph Zubin* 10
III. Principles and Techniques of Briefer Psychotherapeutic Procedures. *Franz Alexander* 16
IV. Long Term Psychotherapy. *Kenneth E. Appel, William T. Lhamon, J. Martin Meyers and William A. Harvey* 21
Summary of Papers I–IV. *Maurice Levine* 35

SECTION II

V. Recent Advances in Psychoanalytic Therapy. *Sandor Rado* 42
VI. Social Factors in Therapy. *Jurgen Ruesch* 59
VII. Milieu Therapy. *David McK. Rioch and Alfred H. Stanton* 94
VIII. A Research Program in Client-Centered Therapy. *Carl R. Rogers* 106
Summary of Papers V–VIII. *John Romano* 114

SECTION III

IX. Areas of Research in Group Psychotherapy. *Jerome D. Frank* 119
X. Dynamics and Clinical Applications of Group Psychotherapy. *Samuel B. Hadden* 127
XI. Evaluation of Therapeutic Results in Child Guidance Programs. *George E. Gardner* 131
XII. Evaluating Therapy in a Delinquency Prevention Program. *Hans-Lukas Teuber and Edwin Powers* 138
Summary of Papers IX–XII. *David M. Levy* 148

SECTION IV

XIII. Critical Evaluation of Hypnosis. *Jerome M. Schneck* 151
XIV. Principles and Techniques of Therapy in Psychosomatic Disorders. *Theodore Lidz* 156
XV. Setting Goals of Treatment in Psychosomatic Medicine. *Milton Rosenbaum, Morton F. Reiser and John Higgins* 160
XVI. Appraisal of the Results of Treatment of Stress Disorders: Preliminary Report. *Beatrice Berle, Ruth Pinsky, Stewart Wolf and Harold G. Wolff* 167
XVII. Factors Influencing the Effectiveness of Treatment in Private Practice of Psychiatry. *Wendell Muncie* 178
Summary of Papers XIII–XVII. *Morris Herman* 185

BIOLOGICAL, ELECTRICAL, AND PHARMACOLOGICAL TREATMENTS

SECTION V

XVIII. Current Evaluation of Insulin Therapies. *Joseph Hughes* 193
XIXa. Current Evaluation of Electric Convulsive Therapies: Correlation of the Parameters of Electric Current with Physiologic and Psychologic Changes. *W. T. Liberson* 199

XIXb. Clinical Applications of Electric Convulsive Therapies. *Lothar B. Kalinowsky* 232
XX. Evaluation of Newer Pharmacodynamic Therapies (including the Narcoanalytic Use of Drugs). *Paul Hoch* 239
XXI. Prognostic Tests Indicating the Effectiveness of Treatment. *Daniel H. Funkenstein, Milton Greenblatt and Harry C. Solomon* 245
Summary of Papers XVIII–XXI. *Francis J. Braceland* 267

SECTION VI

XXII. The Role of ACTH, Cortisone and Hydrocortisone in the Provocation of Certain Psychologic Responses. *Howard P. Rome and Francis J. Braceland* 273
XXIII. Carbon Dioxide Inhalation Therapy. *Ladislas J. Meduna and Abraham I. Jackman* 280
XXIV. Evaluation of Drugs in the Treatment of Alcoholism. *Mary Jane Sherfey and Oskar Diethelm* 287
XXV. Anti-epileptic Drugs in the Treatment of Behavior Disorders. *H. Houston Merritt* 295
Summary of Papers XXII–XXV. *D. Ewen Cameron* 301

NEUROSURGICAL TREATMENTS

SECTION VII

XXVI. Evaluation of Lobotomy with Special Reference to Children. *Jonathan M. Williams and Walter Freeman* 311
XXVII. Criteria and Experimental Design for Evaluating Results of Lobotomy *Richard L. Jenkins and James Q. Holsopple* 319
XXVIII. Physiological Changes Predictive of Clinical Outcome following Frontal Lobe Surgery. *Harry C. Solomon and Milton Greenblatt* 328
XXIX. Treatment of Psychomotor States by Anterior Temporal Lobectomy: a Report of Progress. *Percival Bailey, John R. Green, Luis Amador and Frederic A. Gibbs* 341
XXX. Observations on Medial Temporal Lobotomy and Uncotomy for the Treatment of Psychotic States. *W. B. Scoville, R. H. Dunsmore, W. T. Liberson, C. E. Henry and Anthony J. Pepe* 347
Summary of Papers XXVI–XXX. *A. Earl Walker* 370

SECTION VIII

XXXI. Cingulate Cortex Isolation for the Treatment of Psychoses and Psychoneuroses. *Kenneth E. Livingston* 374
XXXII. Thalamotomy and Hypothalamotomy for the Treatment of Psychoses. *E. A. Spiegel, H. T. Wycis, Herbert Freed and Carlton Orchinik* 379
XXXIII. Frontal Lobe Surgery: Its Value in the Treatment of Pain with Consideration of Postoperative Psychological Changes. *Frances Bonner, Stanley Cobb, William H. Sweet and James C. White* 392
Summary of Papers XXXI–XXXIII. *J. Lawrence Pool* 422
List of members 430
Index 445

INDIVIDUAL AND GROUP PSYCHOTHERAPY

Section I

CHAPTER I

THERAPEUTIC GOALS AND THEIR SIGNIFICANCE FOR THERAPEUTIC STRATEGY

JOHN C. WHITEHORN

Our topic for this year covers an extremely wide range of conditions and a great variety of therapeutic procedures. Facing so diversified an agenda, there may be some value in sketching at the beginning a broad perspective of therapeutic aims and strategy. There is no prescriptive or prohibitive intent in what I shall say, no desire to curb the speakers or the discussers or the questioners, but rather the desire to delineate a constructive perspective in which therapeutic procedures, of apparently divergent aims, can be brought into a general frame of reference. That there may be some rational frame of reference for therapy in psychiatry is implied in the very term "Therapeutic Strategy". Without some sense of aim or goal, giving meaning to our tactics or techniques, research in therapy would have for its foundation only the most shallow empiricism, and we would be greatly handicapped in any systematic investigation to validate our techniques or to measure the degree of success of our efforts.

To compose so broad a range of topics in a comprehensive frame of reference, it is necessary to get back to simple, basic ideas.

The profession of medicine in general is dedicated to the care of the sick. This is an humble aim, less glamorous than the conquest of disease. In psychiatry, particularly, the care of the patient, in a period of sickness, is an important and basic purpose; for the psychiatric patient may be his own worst enemy. He needs care, for the period of illness, to save him, so far as is feasible, from his own malign proclivities. Only patients who are kept alive can respond to therapy, and whatever serves to make life more endurable or to enlist the patient's interest or enthusiasm serves to some extent as part of therapy.

In psychiatry, as in medicine in general, we rely heavily upon the healing power of nature, the biological potentialities for recovery and health; but with expectant optimism it is natural for us to try to offer an "assist" to nature. Even the most arrogant claimant for cures should be content with the entry on his score card of an "assisted recovery". Active intervention,

with the aim of assisting recovery, cannot rationally be attempted without some idea, explicit or implicit, as to what is going on in the patient and what we are trying to do about it.

From a long and valuable tradition in medicine, it has become professional second nature, almost, to assume that what is going on in the patient is "a disease", and the therapist's task is classically dramatized as a "fight" against "the disease" which has "attacked" the patient. This mode of medical thought has been firmly lodged in the professional mind by a long and honorable history, and the extraordinary effectiveness of this working concept in dealing with "the infectious diseases" has converted it almost into an axiom.

The concept of therapy as the cure of "the disease", or "victory over the germ", has found footing in the lay mind also, but not perhaps with the same domination. At least there are patients who become a bit perturbed at the physician's over-zealous scientific interest in "the disease", and who plaintively remind him that what they want primarily is relief from distress. This patient-oriented way of thinking, focussed upon the experience of suffering (his pathos) would be made clearer still if I could only lisp effectively and say pat-h-ient—thereby accentuating his role as the bearer of the pathos or suffering. The pat-h-ient is most acutely aware of his "DIS-EASE"—call it pathos or distress or suffering. To the pat-h-ient, the doctor's concern about "the disease" is mainly justified because it leads to a potentially more effective and permanent way of relieving his "dis-ease".

Let us put aside, momentarily however, the military metaphor of fighting the disease, not to *discard* the idea, but to put it in reserve for a moment, as a useful instrumental abstraction, but not the only way to think about therapy.

Attempting a more general perspective, I think one can say that in the care of the sick, when therapeutic interventions are attempted they are aimed in general at one of three objectives (or maybe all three at once), namely, (1) to save from death, (2) to relieve from distress, and (3) to overcome disability. Concepts incorporating the first two aims have long ago been built into medical language—in the English term "disease" and the Latin synonym, "morbus". "Morbus" is not etymologically the exact equivalent of "disease", being derived rather from the word morior, to die, and representing therefore the threat of death as the antagonist against which therapy is to be directed.

For the third objective of therapy—to overcome disability—we have recently begun to think, earnestly, about rehabilitation, or re-training or some other modality of intervention, but only on second thought do we think of these as medical functions, or as therapy. I do not mean that the medical profession has only had such professional thoughts since day be-

fore yesterday, or in the present decade. Surely, the surgeons for centuries have aimed to assist nature in the restoration of optimal functional effectiveness, as in the setting of bones, in the correction of deformities, etc. Nor do I mean to imply that the idea of overcoming disability is foreign to medicine, certainly not antagonistic to medical thinking, but I mean rather that it has not occupied the *focal spot* in thinking about therapy so clearly as the other two aims—to save from death or to relieve from distress.

To overcome disability has seemed, to physicians in general, a secondary or tertiary aim of therapy—a more humble objective—a melioristic approach to the patient, offering some help toward doing better but not promising the complete contentment of a radical cure.

In the field of psychiatric therapy, at the present stage of progress, it appears to me that most psychiatrists face their therapeutic opportunities and responsibilities with an essentially melioristic approach, aiming to help the patient overcome disabilities, in some measure, and to do better. The widespreading idea of reaction-types, rather than disease entities, as the focus of differential diagnosis, has served to rationalize the melioristic approach.

We deal in psychiatry with many persons who are, in significant degree, *self-disabled*: seriously hindered in social functioning by inner personality conflicts; hampered in their grasp of so-called "reality" by self-constructed delusions, obsessions and other reaction-formations; stiffened in personality structure and function by keloid-like scars; enslaved to the malign operations of unconscious dynamics by the miscarriage of the function of repression; or down-graded in their personal functioning by the force of bad habits. There is no promise of radical cure of *self-disablement*, by any "silver bullet", or sulfa or antibiotic designed to knock-out the offending organism, since the offending organism is the patient himself.

Nevertheless, there seems to have been some progress in therapeutic interventions aimed at *wounding* this noxious partner within the patient's skin—strategies of therapy which, by surgical procedures or electrical assaults, or drugs, selectively disable the patient from disabling himself so severely, and thereby yield a differential result, algebraically favorable to the patient *as a whole*—or as a tolerably mutilated whole. With such methods of therapy, the balancing of potential gains against potential losses, and against the possibilities and probabilities of other means of therapy, has become an excruciatingly difficult and complex problem of therapeutic strategy.

We can set down therefore as one of the conscious strategic aims of some types of therapy, the therapeutically differential disablement of the patient, as an aid to his better over-all functioning—a melioristic goal, but a drastic technique, sometimes mis-called "radical". One of the commonly

used criteria of successful therapy of these types, is "social improvement" or "social recovery", meaning roughly the patient's level of ability to get along in a family setting, to hold a job and to keep out of the jail or the hospital. Such a minimal criterion of social recovery or improvement is not the optimal aim of therapy, but it is clearly a very pertinent consideration, particularly for patients who have been severely psychotic, because the outstanding practical disablement in the severe psychoses consists in the severe impairment of one's social functioning.

There is a school of thought in psychiatry which views the disturbance of social functioning not just as a symptomatic expression of psychiatric illness, but rather as the reverse. The characteristic viewpoint for this group of psychiatrists may be formulated in the hypothesis that disturbances of interpersonal relationships (more precisely, maladaptive interpersonal attitudes and expectancies) constitute the *basic psychopathology* and that the ordinary, clinically recognizable symptoms of mental and emotional illness are the *manifestations* of these morbid interpersonal attitudes. From the viewpoint of this hypothesis, the morbid interpersonal attitudes may be viewed as "the disease", and the correction of such morbid attitudes, if accomplished completely, would be a radical cure of "the disease". There would, however, be a logical place for melioristic, as well as radical, aims in the therapeutic strategy based upon this conception. It is my impression that this hypothesis, in one form or another, is widely utilized by American psychiatrists and that it plays a large role, explicitly or implicitly, in the planning of therapeutic strategy, even though tactics differ widely. There are also significant differences in theories as to the pathogenesis of morbid interpersonal attitudes.

Before turning to a consideration of these significant theoretical *differences*, which have a bearing on therapeutic aims and strategy, we should consider the way in which this general "interpersonal" view influences therapeutic strategy in trying to deal with *anxiety*. The naively sympathetic would-be therapist has a natural desire to relieve anxiety, in line with the general medical goal of relieving distress. The patient is also usually eager to be relieved of anxiety. Those therapists, however, who seek to lead the patient to correct his maladaptive interpersonal attitudes and to develop better attitudes, look upon the patient's anxiety as, in some measure, a necessary spur to effort and a necessary aspect of the learning process, without which there would be no modification of attitudes, and no progress; yet they recognize that anxiety may be a bar to progress or at least a hindrance when too great or when too tightly linked in phobic or depressive patterns of reaction. The attempt to control the intensity of anxiety within tolerable limits and to utilize it is, therefore, a large part of the tactics

in those forms of therapy which aim at the modification of interpersonal attitudes.

There is some reason to think that the drastic types of physiological and pharmacological therapies may operate, in part at least, by moderating the anxieties of the patient, especially by interrupting fairly specific patterns of dread, and thereby freeing-up the patient, in some measure, so that fresh relationships may be established and less malign patterns may be formed.

Another basic strategic consideration in this context is that of immaturity of personality, the idea that there may be a deeply significant arrest of social and emotional development, leaving one seriously handicapped in interpersonal relationships by fixation at levels of infantile, childish or adolescent attitudes and systems of value, thus seriously incapacitating one when faced with interpersonal situations of a later phase of life. For therapeutic strategy, the emotional relationship between patient and therapist may be viewed, in this context, as providing a fresh opportunity for the untying of knots and the acceptance and utilization of new and more mature emotional attitudes regarding authority relationships, affectionate relationships, and interpersonal responsibilities, whereby the fixated immature patterns can be loosened and modified. From my own experience, I am inclined to view this opportunity for emotional re-learning as the crucial point in those types of therapy which are aimed at the improvement of interpersonal attitudes. For such purposes one can operate helpfully with the concept of the "meaning" of experience and behavior. In psychotherapy aimed at the modification of attitudes, it is of crucial strategic importance to recognize the necessity that the patient must experience during therapy some acute emotional disturbance, without which no significant change in attitude is likely to occur.

A third strategic consideration, in the therapy which aims at the improvement of interpersonal attitudes, may be roughly designated as "habit". New and better interpersonal attitudes, more mature systems of value, developed in the crucial therapeutic relationship, need to be exercised and practiced in new social relations and situational contexts, and there is much strategic importance in the personal settings and experiences provided to the patient, for consolidating his gains by the power of habit. Here it is of special importance to help the patient integrate his gains with the more constructive and adaptive habits and attitudes in his past life.

At this point we may note the recent turmoil in psychoanalytic circles regarding Alexander's formulations about psychoanalytic therapy, which as I understand it, represents not merely a dispute about method but also a difference in therapeutic goals. We may consider at this point the claim,

commonly expressed by psychoanalysts a couple of decades ago, that psychoanalysis was the only real psychotherapy as it was based upon the only real psychopathology. The arrogant tone of such comments, characteristic of a vigorous movement of rebellion, has moderated somewhat, with the years and with the broader validation and acceptance of some psychodynamic principles, which had been enunciated as part of the psychoanalytic doctrines. There is, however, a rather specific viewpoint which has sharply characterized psychoanalysis, as a therapeutic method, and which delineates pretty sharply the goal of such therapy. This is the view which looks, exclusively, into the dynamic operations of the *repressed unconscious* for the pathogenesis (and *the cause*) of psychopathological developments. In this conceptual framework, which we may call the classical psychoanalytic view of the early twentieth century, the strategic goal of psychotherapy, if proposed as radical therapy, should be the removal of the repression and the disclosure to consciousness of the hidden meanings and motivations, since their pathogenicity was considered to be uniquely related to the special dynamics of the repressed unconscious. It is a common reproach that the frequent ineffectiveness of abreaction therapy and of insight therapy disprove such claims. This reproach may not be altogether conclusive, since it can be countered by the claim that in such instances "true insight" has not been achieved, or that a real abreaction has not occurred. One is at the border here, of the difficult metaphysical problem as to the nature of truth or reality. Keeping on the practical side of this metaphysical border, there still is a clearly discernible characteristic in the aim of strict classical psychoanalysis, as therapy, and that characteristic lies in the crucial pathogenic importance assigned to those psychodynamic operations which go on beneath the barrier of repression, and in the crucial psychotherapeutic significance of bringing them to consciousness. Hence, the tactical importance which is attributed to free-association and dream-analysis, by those holding such views. There is a correlative emphasis, in tactics, upon intense and intimate emotional relationships between patient and therapist, with high frequency of interviews and protracted duration.

Let us return now to our general perspective, in which three goals of therapy have been delineated: (1) to save from death, (2) to relieve from distress, and (3) to overcome disability. I wish to add also, now, one result which sometimes follows successful psychotherapy, namely, the highly gratifying report which comes from an occasional patient in words like these: "Doctor, I'm glad I got sick and had to be treated. Somehow, after that experience, I've really been living, in a more vital way than ever before." Such remarks are, of course, subject to discount. The ex-patient is sometimes deceived, sometimes deceiving. He may merely have become

a new kind of obsessive fanatic, newly charged, with a different variety of spurious zeal. But sometimes this superior freedom and vitality is genuine. In some instances there is much evidence that an unusual degree of effectiveness and satisfaction and inner freedom has been gained, higher than in that patient's previous experience, and somewhat beyond the common lot of man.

I look upon this superior state of health and of freedom as being a kind of bonus, an unearned and delightful surplus gain from psychotherapy. The perfectionist in therapy may adopt it as a deliberate regular goal, aimed at from the beginning in every case. If so, one would have to be highly selective in the acceptance and rejection of patients and the rejects would then become problems for someone else.

But even such a perfectionistic goal has a special value in a general perspective, because it high-lights the practical point that progress, even toward a perfectionistic goal, is step-wise. The subsidiary and minor goals then determine the strategy for a particular phase of treatment. For this purpose one must evaluate patients' needs, complaints and potentialities in a highly individual manner, and with great respect for proper timing.

CONCLUSION

In this hasty survey an attempt has been made to present a general perspective regarding the aims of therapy in psychiatry, formulated as (1) to save from death, (2) to relieve from distress and (3) to overcome disability. My most sympathetic remarks have been concerned with therapy aimed at overcoming disability by the correction and improvement of the patient's interpersonal attitudes and expectancies. I see in this a reasonably specific basis for melioristic therapy, and potentialities for occasional success in radical therapy, and I have attempted, around this general theme, to arrange sympathetically a conspectus of other views by which therapeutic aims and strategies are oriented.

CHAPTER II

DESIGN FOR THE EVALUATION OF THERAPY

JOSEPH ZUBIN

Three basic questions seem to me worth your serious attention:

1. What are the minimal requirements of the design for research in evaluating the outcome of therapy?
2. What have designs which have been used up to the present time revealed about the efficacy of various therapies?
3. What future steps must be taken to improve evaluation of outcome of therapy?

The minimum essentials of a design for evaluating the outcome of any therapy, be it in the mental disorders or in the physical disorders, are: 1) a homogeneous group of patients; 2) a comparable untreated control group; 3) a sufficient follow-up period and 4); specific criteria for evaluating outcome.

The need for homogeneity in age, duration of illness, diagnosis and other important relevant variables in the patient group under treatment is so fundamental in any research that it can be dismissed without further comment. The control group, however, needs more discussion. Despite some opinions to the contrary, the principle of the control group is essential to the evaluation of therapy and is as applicable to mental disorders as it is to physical disorders. Differences of opinion may arise however in the methods of selection of controls. Because of our ignorance of the etiology of many mental disorders we can not always be sure that our controls are truly comparable to our treated cases. Furthermore, since we have to deny, at least temporarily, the benefits of any specific therapy to the control group, some hesitancy arises in the selection of a given patient for such a purpose and the fact that he does not receive specific treatment may lower his morale and motivation for improvement. Despite these difficulties, no better method is now available and the question of maintenance of morale can now be answered by providing the control group with "total push". If the number of patients to be treated is small, the statistical analysis of the data requires that the control group be matched patient for patient with the treated group in all variables relevant to outcome. If larger groups, say several hundred, are to be treated, random sampling from the large reservoir of patients can be made for both the treated

and the control group. The tendency of placing in the control group patients for whom treatment is contraindicated is a dangerous one since these patients may differ from the treatment group also in their chances for recovery.

The period of follow-up is another much neglected but important consideration. Immediate outcome of therapy after a short follow-up period (3 months for example) is often quite different from the outcome at the end of a long follow-up period (5 years or more). The duration of the follow-up period, the method of follow-up whether by personal interview or by mail and the thoroughness of the follow-up should be recorded adequately if trustworthy comparisons are to be made with other studies. Not only the status of the surviving patients should be obtained but also the status before death of the deceased, and the status at time of last contact of those who were subsequently lost to the study.

The criteria for the evaluation of outcome must be specific and stated in objective terms. Such terms as cured, improved, ameliorated, worsened, can vary so much in their significance that they are worthless for comparative studies. In the absence of better standards, the criterion of improvement most in vogue today is whether the patient was discharged and remained at home. This criterion is often faulty because discharge may sometimes depend merely upon the willingness of the family to receive the patient or on other incidental factors. But it is often the best criterion of improvement available today. When more specific methods for evaluating degree of improvement are available, a question often arises about the degree of improvement to be expected in mental patients. Excluding the milder non-chronic neuroses and possibly the true manic-depressive psychoses, it is doubtful whether cure in the sense of return to premorbid level is to be expected any more frequently in chronic mental disease than in chronic physical diseases like tuberculosis or cancer. One of the most crucial tests of the value of a specific therapy in the chronic physical disorders, *prolongation of life*, is denied the psychiatric therapist since prolongation of life of a mental patient has never been regarded as a goal in itself. Yet, the remarkable achievement of the shock therapies in reducing patient mortality due to inanition or physical exhaustion is one of the unheralded outcomes of present-day therapy. Long-term follow-up studies usually indicate a higher level of mortality for the control group even in hospitals where good care is afforded. In view of the generally higher mortality rates which characterize chronically ill mental patients, a characteristic common to all chronic illness, evaluation of outcome of therapy must eventually take into consideration the extension of life following treatment.

The clinically perceptible improvement in behavior, feeling tone, ambi-

tion, sociability etc., which accompanies successful therapy is one of the most difficult areas of evaluation. The subjective clinical evaluation has been supplemented by objective rating scales and behavior charts and sometimes by tests. At the present time, however, no generally acceptable yardstick of improvement is available, though the basis for such a measuring rod has already been delineated in the literature.

The results of the application of these four criteria in the design for the evaluation of therapy have yielded some unexpected findings. A survey of the literature indicates that not more than a dozen adequately designed long-term follow-up studies are available. Nearly all the immediate outcomes in these studies indicate a definite advantage for the specific treatment as compared to the control group. Patients are discharged home much sooner and remain out of the hospital longer. In diseases for which rational therapies have been discovered, e.g., general paresis and pellagra, the degree of improvement and its permanence is limited only by the amount of residual damage produced by the disease. In the case of the still irrational shock therapies, the degree of improvement and its duration in long-term follow-up studies seems *to show no advantage* over the nonspecific therapies given the control groups, with few exceptions. This does not lessen the important contribution made by the irrational therapies to the saving of human misery and of public funds by the early discharge of the treated patients, and by the apparent increase in their longevity. But the fact that the long-run comparison shows no advantage for the specific therapies must lead both the clinician and the research worker to ponder. (It may be pointed out parenthetically that the shock therapies are not alone in their failure to show an advantage in long-term follow-up studies. Such data as are available for psychoanalytic therapy and psychotherapy lead to the same conclusion. The data on psychosurgery are still too meager, but even for this therapy there are already some indications that the advantage is not too striking.)

Why this should be so is one of the most baffling questions facing the research worker. One possible answer is that the specific therapies simply hasten the improvement of those who would eventually improve anyhow. A more hopeful note is struck by the observation that the pretreatment characteristics of those who eventually improve are often significantly different from those who fail to improve. Whether these differences are related to outcome regardless of therapy or whether some therapies will be more suitable for patients with certain characteristics can not be answered definitely at this time.

In order to improve the evaluation of outcome of therapy several important steps seem necessary. First, some easier method must be found for establishing control groups. The work with the treated patients alone

is sufficient to tax even our best equipped hospitals. The provision of additional staff, "total push" methods etc. for the control group is often the straw that breaks the camel's back. Ethical problems also arise in the relegation of a given patient to a control group, as will be discussed by Drs. Jenkins and Holsopple. There is no reason why each hospital wishing to conduct a research in a specific therapy must provide its own control group. If we could provide standard control groups for the various types of mental patients to whom the various therapies are applicable, these could then become the basis for the selection of patients who are to undergo treatment by a specific therapy. Thus by inverting the procedure of matching controls to treated groups and instead matching treated groups to available standard control groups, it may become possible to hasten the process of the evaluation of therapy in all its aspects. Instead of selecting patients at random, future investigators for whom standard control groups are available will try to select for treatment patients who match the already available controls. The patient populations which would ordinarily not receive specific therapies because of various reasons not related to their illness could be utilized for establishing these standard control groups. By providing these selected populations with the best levels of care including "total push" methods, the base-lines so sorely needed in the evaluation of therapy could be established. The five-year follow-up on such a population will then make available standards of expected improvement which the matched specific therapy groups must meet or beat. The data now available in the literature on long-term follow-up studies are not adequate for reasons which have been indicated elsewhere (5). These may be summarized as follows:

1. The early pre-1930 data are not trustworthy as a guide because they are based on the total available patient population of that period, and not on such selected groups as those to which therapy is administered today.

2. There have no doubt been shifts in the character of the patient population as a result of the wide-spread use of therapies, and mental hygiene education.

3. The diagnoses of the previous decades are not comparable with those of today.

4. The interval of follow-up is not always indicated in previous studies, and when indicated, it is not always uniform for all the patients.

5. Even when control groups are utilized, they often consist of the patients in whom some contraindication was found, or for whom permission could not be obtained for therapy. When control groups are selected they are rarely afforded the same level of "total push" as is given the treated group.

Another advantage of the standard population is the possibility of pro-

viding prognostic indicators for each patient based on his status, characteristics, test performance, etc., at the time he became a member of the standard control group. In this way, the prognosis under control conditions can be compared with actual outcome under the specific therapies for each type of patient. Thus, a probability chart can be provided indicating the chances of recovery for each type of patient under control conditions of non-specific therapy ("total push"), ECT, insulin, psychoanalysis, psychotherapy, psychosurgery, and any other therapy that may be tried.

To be sure, this is a somewhat idealistic plan which will have to compromise with many realistic difficulties arising from our lack of knowledge about the true comparability of various individual patients who are to be matched with the controls. Special travelling teams of expert psychiatrists, psychologists, social workers and biometricians will have to be provided for keeping the research on standard populations up to date and for deciding comparability of patients in various parts of the country. But without such a method for evaluating outcome of therapy, we are reduced to accepting the judgment of outcome made by three of the most biased persons connected with the therapy—the clinician, the patient and his family.

In dealing with long-term follow-up studies a new consideration arises which has thus far not received any attention in the evaluation of outcome of mental disorders. When a 5-year follow-up is undertaken, the group of improved and discharged patients under study may show the following changes in status: (a) remain in that category to the end of the follow-up, (b) relapse, (c) die of causes unconnected with their disease and, (d) be lost sight of. The unimproved and undischarged patients may similarly (a) remain in their status quo, (b) improve and be discharged, or undergo one of the other two changes in status described above. Furthermore, the patients may go through relapse and recovery several times in the course of the follow-up. Statistical methods for evaluating the net outcome regardless of the temporary alterations are a *sine qua non* in future evaluation of outcome of therapy. The need for such statistical evaluation of outcome has been forcibly brought to our attention by a recent controversy in the Journal of Mental Science regarding Karagulla's study on the outcome of convulsive treatment in depression. Both Karagulla (3) and her critic Slater (4) used crude rates of improvement, the first eliminating deaths and the second including deaths in his calculations. Neither argument is conclusive and only the application of the mathematical model devised by Jerzy Neyman (1, 2) can provide a definitive answer through the computation of net improvement rates which are freed from the influence of deaths, relapses, etc. A tentative analysis indicates that the net improvement rate of the treated group is generally not different from the corresponding rate in the control group in the above study.

SUMMARY

The basic elements in the design for the evaluation of therapy are: 1) a homogeneously selected group of patients; 2) a comparable control group; 3) a sufficiently long follow-up period; and 4) specific objective criteria for evaluating outcome. A review of the literature indicates that only a small number of studies satisfy these criteria. The results of these studies indicate that specific therapies as contrasted with non-specific therapies yield better *immediate* outcome, but in the long run, no better *eventual* outcome. Such a result can be explained either by assuming that the present-day therapies do not alter the basic course of the disease but only hasten the improvement of patients who would have eventually improved anyhow, or that insufficient knowledge is now available for selecting the most suitable therapy for each patient.

In order to provide prognostic criteria and generally available control groups for future studies, a reversal in ordinary procedure is suggested. Instead of first selecting the group for treatment and then searching for controls, it is proposed to select standard control groups which will be carefully evaluated and studied in long-term follow-up. Investigators will then select their treatment groups to parallel the already established standard control groups. These standard control groups can then serve as a gauge for evaluating the results of a specific therapy. In this way it may be possible to determine quickly and directly the efficacy of each of the established specific therapies, and of a newly-proposed therapy. The provision of such standard control groups and their supervision as well as the decision on the comparability of treatment groups will entail many difficulties and involve the creation of a special commission of experts. Without such standard procedures, however, there is little hope for attaining scientifically valid evaluation of the outcome of therapy. This is the strategic moment for developing such standard populations since the general public is aroused to the need of more humane care in all the states. In another decade, it will be impossible to find states in which the natural history of mental disease, uncomplicated by specific therapies, can be studied.

REFERENCES

1. Fix, E. and Neyman, J.: A simple stochastic model of recovery, relapse, death and loss of patients. Human Biology, *23:* 205–241, 1951.
2. Neyman, J.: First Course in Probability and Statistics, p. 69–95. Henry Holt and Co., 1950.
3. Karagulla, S.: Evaluation of ECT as compared with conservative methods of treatment in depressive states. J. Ment. Sci., *96:* 1060–1091, 1950.
4. Slater, E. T. O.: Evaluation of electric convulsion therapy as compared with conservative methods of treatment in depressive states. J. Ment. Sci., *97:* 567–569, 1951.
5. Zubin, J.: Evaluation of outcome of therapy. J. Nerv. Ment. Dis., March 1953.

CHAPTER III

PRINCIPLES AND TECHNIQUES OF BRIEFER PSYCHOTHERAPEUTIC PROCEDURES

FRANZ ALEXANDER

The classification of psychotherapeutic methods according to the time factor is justified for practical reasons only. Unlike a surgical operation, psychotherapy consists mostly of repeated, time-consuming interviews. Time and economy, therefore, are important practical considerations in psychotherapy. Nevertheless in choosing a psychotherapeutic method the first consideration should be the nature of the therapeutic problem and not economy. To try to use a brief approach in the case of a chronic condition such as a compulsion neurosis or character neurosis, no matter how desirable it might be, is not sound medical practice. The first consideration in the choice of a treatment method should not be practical exigencies such as available time, case load or financial considerations, but the suitability of the method of treatment. In emergency situations when a great number of patients require immediate help, it might be imperative to give at least some temporary aid to every patient and postpone effective therapy until later.

In the following discussion, emergency situations will not be considered. The different therapeutic approaches will be discussed according to indications based on the nature of the therapeutic problem. At the present when the demands for psychotherapy exceed by far the existing therapeutic facilities, this approach may sound impractical and too theoretical. On the other hand, the distribution of existing treatment facilities according to prevailing needs is a question of medical administration and cannot help us to clarify the basic therapeutic issues involved.

In the following, only therapeutic procedures which are based on the knowledge of the disease will be considered. Procedures which are merely empirical or intuitive, although sometimes successful, will not be included. This may sound arbitrary but therapies which are highly individual do not lend themselves to systematic analysis.

Furthermore, I will restrict this discussion to the major applications of psychotherapy in the field of psychoneuroses, behavior disorders and the disturbances of the vegetative functions in which psychological factors have an etiological significance.

Our question is then, which conditions in the above categories lend themselves to briefer therapeutic procedures.

It is customary today to divide psychotherapeutic procedures into two distinct categories: the supportive and the uncovering procedures. It is commonly assumed that the former types are always briefer than the latter. One of my points is to show that this assumption is far from being accurate.

In the first place, it must be borne in mind that supportive measures knowingly or inadvertently are used in all forms of psychotherapy. Conversely, some degree of insight is rarely absent from any form of approach. In the complex field of psychotherapy, pedantic distinctions do not do justice to the actual procedures.

In psychoanalysis the ultimate goal is to increase the ego's ability to handle emotional conflict situations which originate mostly in childhood and infancy and which are precipitated by actual life situations. This goal is achieved by re-exposing the ego in the treatment situation to the original conflicts, thus making a new solution possible. The principal therapeutic factor is the transference in which the patient relives early interpersonal relations. Mostly these have become internalized as inner conflicts and during the treatment they are transformed back again into their original form as interpersonal reactions between patient and therapist. Regression to the dependence of infancy or childhood is one constant and central feature. This regression in itself has a supportive value—it allays the fears and insecurities which arise from the necessities of adult existence to meet life situations and responsibilities in an independent fashion. There is no use denying that in many instances the primary therapeutic effect of psychoanalysis consists of precisely this kind of support which the patient resists to give up by terminating the treatment. The so-called interminable treatments, so far as their therapeutic effect is concerned, are of supportive nature no matter what the original therapeutic aim might have been when the treatment was first undertaken. And conversely, in many supportive therapies, as soon as the patient's anxiety subsides, his ego becomes capable of facing conflict situations even though the therapist's original goal was merely to give emotional support. Improvements in many so-called transference cures may persist just for such reasons. Such transference cures occur when the ego's integrative capacity is only temporarily impaired in acute emotional stress. The emotional support provided by the therapeutic situation reduces the acute stress and thus enables the ego to regain its functional capacity without any further activity on the part of the therapist.

We differentiate among three basic functions of the ego: 1) perception—both the *internal perception* of subjective needs and the *external perception* of the environment upon which the gratification of the subjective needs

depends; 2) the *integrative function* which consists of the coordination of the data of internal and external perception; 3) the *executive function* based on the ego's control of neuromuscular behavior by which the subjective needs can be satisfied. Any of these functions can be impaired. Internal perception is impaired by excessive repressions which exclude from consciousness all those impulses which the ego is incapable of handling in a syntonic fashion. The disturbance of external perception consists in the inability to grasp the total situation which a person has to face. LaForgue suggested for this dysfunction a suitable term: scotomization, an expression which is not widely used. The most important disturbance consists in the impairment of the integrative faculty. The latter depends to a high degree upon the intactness of internal and external perception, but in itself is a cognitive function highly susceptible to emotional stress. The grasp of the total external and internal situation requires a certain amount of emotional detachment and postponement of immediate action. In acute anxiety, rage or frustration, an otherwise intact integrative faculty may be temporarily impaired. The duration of the treatment primarily depends upon the degree to which the ego's functional capacity is impaired and upon the nature of this impairment.

Primarily, supportive measures are indicated whenever the functional impairment is of temporary nature caused by acute emotional stress. In such cases the therapeutic task consists first of all in lending the ego sufficient support in the form of *gratifying dependent needs* during the stress situation, thus reducing anxiety. Another important therapeutic device consists in reducing emotional stress by giving opportunity for emotional *abreaction*. A more intellectual type of support consists in *objectively reviewing* the patient's acute stress situation and assisting his judgment which is impaired temporarily under the influence of intensive emotional tensions. The patient thus becomes able to view his total situation from a proper perspective (M. Levine's "*ventilation*").

In addition to these three forms of support, the therapist occasionally will have to *aid the ego's own neurotic defenses*. This is indicated whenever there are definite reasons to mistrust the ego's capacity to deal with unconscious material which threatens to break into consciousness through the weakened defenses. Finally, whenever the neurotic condition results from the fact that the patient is chronically involved in particularly difficult external life situations which are beyond his ability to cope with, the *manipulation of the life situation* may be the only hopeful approach. This is of course indicated only in cases when for external or internal reasons there is no hope for increasing the ego's functional capacity by prolonged treatment.

These five procedures: gratification of dependency needs, abreaction,

intellectual guidance, support of neurotic defenses, and manipulation of life situations, constitute the essence of brief supportive measures. Occasionally they may consist of one or two interviews, or more often, of a series of sessions of variable duration. There is no way to predict precisely the duration of such treatments and the therapist must proceed empirically and base his judgment upon the actual therapeutic progress.

Chronic conditions in which the ego's functional impairment is caused by unresolved emotional conflicts of the past, require systematic and more prolonged treatments in which the patient's ego is re-exposed to his earlier pathogenic interpersonal experiences. No hard and fast rules exist to predict the length of such treatments. So far as time is concerned, there is a continuum from treatments requiring a few months to prolonged procedures of several years' duration.

A few years ago a book on psychoanalytic therapy published by the staff of the Chicago Institute for Psychoanalysis aroused a heated controversy concerning the question as to where the line between psychoanalysis and psychoanalytically-oriented psychotherapy should be drawn. No matter how heated this controversey was, on one point both the authors and their critics agreed: that independent of duration, all sound treatments must be based on the psychodynamic understanding of the neurotic disturbance. What is controversial in this whole issue, in my opinion, is primarily a semantic question. Where psychoanalysis proper starts and psychoanalytically-oriented psychotherapy ends can only be decided by some arbitrary linguistic definition. Every etiologically oriented, uncovering type of procedure consists in utilizing the phenomena of transference and resistance to improve the ego's functional capacity by re-exposing the patient, during the treatment, to his unresolved conflicts of the past.

The number of interviews, their frequency and the whole duration of treatment depends on several factors which quantitatively cannot be precisely appraised in our present state of knowledge. The therapist in each individual case must feel his way and find the optimal intensity of treatment. Anticipation of duration at the beginning of the treatment is seldom possible; certainly no accurate estimations can be made in advance.

From all this it should be clear that a rigid distinction between briefer and longer uncovering methods is not possible. The length of treatment is certainly not the most suitable basis of classification, no matter how important practically, this aspect of the therapy may be. The nature of the psychological processes induced by the treatment, together with the therapeutic goals are the only meaningful criteria of classification. Accordingly, the only realistic distinction is not between briefer or longer treatments nor between psychoanalysis and psychoanalytically-oriented psychotherapy, but that between primarily supportive and primarily uncovering methods.

Both types of treatment can be of longer or shorter duration. In fact, in many cases where the impairment of ego functions is very extensive, prolonged, often interminable supportive treatment is the only possible choice.

One cannot leave this topic without referring to a widely-held erroneous view, namely, that briefer psychotherapeutic methods require less technical and theoretical preparation than psychoanalysis. Every psychotherapist must be able to understand the underlying psychopathology and to apply the different therapeutic factors according to the specific nature of each patient. Supportive measures if undertaken without such understanding may not only be ineffective in certain cases, but may jeopardize the chances of recovery by undermining the patient's confidence in the efficacy of any psychiatric treatment. Not infrequently, even such common-sense procedures as giving consolation to a depressed patient or urging the phobic patient to overcome his fears, if improperly applied, may result in aggravation of the condition. Or ill-timed provocation of emotional abreaction in an acting-out neurotic may have serious consequences. Or, strengthening of existing neurotic defenses may not only be superfluous in certain cases, but may unduly prolong recovery. All forms of psychotherapy must therefore be based on the knowledge of personality development and psychodynamics and every psychiatrist who wants to devote his practice to psychotherapy should undergo the same basic training which is required today for psychoanalysts.

I am fully aware of the practical difficulties of fulfilling this requirement at present. And yet we must realize the fact that to reserve a thorough training in psychodynamics, personality development and treatment techniques based on such knowledge to only a small group of psychiatrists, namely, psychoanalysts, means to deprive the rest of them of one significant foundation of their profession. Hence, teaching of psychotherapy based on up-to-date knowledge of psychodynamics including all forms of treatment—prolonged psychoanalysis and briefer procedures, supportive and uncovering treatments—has become the concern of general psychiatric training.

CHAPTER IV

LONG TERM PSYCHOTHERAPY

KENNETH E. APPEL, WILLIAM T. LHAMON, J. MARTIN MYERS AND WILLIAM A. HARVEY

In this discussion of Long Term Psychotherapy an attempt will be made to present some published reports on prolonged psychotherapy, discuss the results of some typical, different methods of psychotherapy, draw some inferences from this material, point to some factors contributing to the duration of therapy, indicate common factors perhaps basic in the therapeutic process, and note some gaps in our knowledge.

BROAD DEFINITION OF PSYCHOTHERAPY

The following definitions of psychotherapy and prolonged psychotherapy are submitted.

Psychotherapy is a purposeful experience providing opportunities for personality growth and improved health through the emotional interaction between patient and therapist, and when appropriate and possible providing for the mutual exploration of the sources of maladjustment and the possibilities of improvement.

Prolonged psychotherapy may be arbitrarily considered as treatment over three months or longer, in which the relationship is maintained so that the patient and therapist have continued interaction. The frequency, intensity, complexity, and duration of the communications between patient and therapist are very flexible, may be varied within wide limits, and are determined by the needs of the patient, the therapist's understanding and use of psychodynamics, and by practical possibilities.

The definition emphasizes that the therapeutic process is an *experience* provided for the patient. It emphasizes the broad experiential nature of the process, like life in general, although it acknowledges the intellectual or procedural aspects of the experience.

GOALS

Goals of psychotherapy are aims, changes, conditions one hopes to achieve by treatment. It is desirable to set up tentative goals for treatment early in each case, so that some evaluation of progress is possible and one may be able to make some estimate of the work yet to be done. The goals of psychotherapy are the maximal reasonable improvements in the follow-

Accession No. 981

ing functions: personal satisfactions, social and vocational effectiveness, physical health, awareness of motivations.

Goals of prolonged psychotherapy will be broadly modified by the following: type of illness, personality and biological status of patient including historical facts, environment.

SOME FACTORS INFLUENCING THE DURATION OF PSYCHOTHERAPY AND ITS GOALS

The natural history of illness must be taken into account whenever possible. Certain illnesses are known to be longer and more stubbornly resistant to treatment than others, e.g., obsessive-compulsive neuroses as compared with hysteria. Some illnesses have a known probability of recurrence even under favorable circumstances. There are illnesses which tend to recover spontaneously and others in which the tendency is towards a more severe and disabling condition. Illnesses with long prodromal stages and with minimal external precipitating stress and maximal endogenous etiology are likely to be more resistant to treatment and to require prolonged treatment. During an illness certain periods of precarious equilibrium may develop with danger of worsening. These may require drastic modifications of goals, therapeutic maneuvers, and may prolong therapy. Certain symptoms such as hallucinations and delusions are more malignant than simple anxiety.

Personality and biological status (i.e., physical condition and medical history) of a patient will modify the need for prolonged therapy and the goals which can be set up for treatment. Factors which tend to require that treatment be prolonged and which indicate that goals of treatment should be modest include the weakness of the ego, the tendency to withdraw, and inability to act realistically or perceive the personal relationships of the environment in a realistic way. Similarly, a loss of aggressive determination to struggle and battle the illness or the absence of such a fighting-back tendency may lower our expectations or require prolonged treatment. The ego may be characterized by a lack of flexibility and adaptability or by a tendency to make transient or weak love attachments. These tendencies would indicate the need for longer treatment. Some ego developments are marked by a will to illness (including strong unconscious urges for secondary gain) and by masochistic trends, both of which tend to prolong treatment. The evaluation of defensive maneuvers of the patient including the strength of repression and resistance and the type of defense mechanisms used is helpful in deciding on the length of treatment; thus the utilization by the personality of mechanisms of projection will be of graver significance than the utilization of conversion mechanisms. Individuals with overly strong instinctual or impulsive needs, in which there may be poor

regulation by the ego or by the conscience on the one hand, and individuals with overly strong and tyrannical control of their impulsive instinctual life are equally in need of prolonged treatment if one is to have reasonable hope for improvement. Genetic and constitutional factors of intelligence and physical status play a part in the need for prolonged treatment and will modify goals which can be erected.

Finally, the immediate environment of the patient in the therapeutic situation, economic realities, and the socio-cultural background of the patient bear importantly on our expectations of improvement and on the need for prolonged treatment. Lack of treatment facilities or lack of time or funds to support treatment may often preclude it. If a patient can be seen only at infrequent intervals due to geographical distance from a therapist, lack of time or money, the question arises as to the feasibility of undertaking treatment. However, if treatment is undertaken with such handicaps, and this not infrequently has to be done, it will inevitably have to be extended over a longer period of time. The occupation of the patient or his ethnic relationship to his environment may be favorable or unfavorable factors. Difficult environmental conditions with little to return to or recover for, will alter the prognosis and the amount of treatment which must be given in attaining goals. For the patient in treatment the degree of experience and personality of the therapist have important practical bearing on the length of treatment; for example, obsessive-compulsive trends, insecurity or other traits in the personality of the therapist may be factors in prolonging therapy. The problem of insight is difficult. One is usually pleased when this develops. However, one knows that intellectual formulations often appear as resistances and defenses, thus prolonging therapy. There is great variation in the ego's capacity for insight, integration and adaptation.

In any individual patient the duration of treatment is directly proportional to the goals of therapy. In evaluating the modifying factors one tries to determine: a) the reasonable goals which can be attained and b) the duration and type of treatment which will be required for attainment of these goals.

PRACTICAL CRITERIA OF IMPROVEMENT IN PSYCHOTHERAPY

Closely connected with the problem of erecting reasonable goals of therapy is that of evaluating in a practical way the success of therapy. Such evaluations are made for a variety of reasons. One may wish to decide on the type of therapy, on discontinuation of treatment, or modification; one may wish to make a progress report or a prognostic statement. Too often, the therapeutic relationship is allowed to roll along with no attention to goals or progress towards goals. In such treatment the relationship

may become a way-of-life for the patient and therapist rather than the purposeful experience desired. The following may be used in the practical evaluation of improvement under treatment: Reduction in frequency, intensity, and duration of symptoms. Improved personal and social relations. Increased adequacy of recreational interests and activities. More effective performance of a role in the cultural matrix. Increased integration, that is, increased working together of parts, energies, and forces of the patient in realistically directed goal activities with decreasing handicapping tensions and increased effectiveness and satisfactions.

Practical criteria of success of psychotherapy are goals of psychotherapy restated so as to allow more accurate judgments to be made. The items listed are given in the order in which they frequently appear in successful therapy. Items are not independent; they overlap at many points. More effective role-taking in the cultural matrix is a broad criterion intended to apply to the vocational and occupational activities carried on by a patient, whether housewife, business executive, teacher, laborer, etc. Integration refers to freedom from contradictory strivings within the personality engaged in realistic pursuits. It will be seen that the criteria listed are to a certain extent a definition of emotional and psychological maturity.

REPORTS OF RESULTS IN PSYCHOTHERAPY

For the evaluation of the results of psychotherapy many statistical studies have been made. The reported results of some of the more carefully evaluated studies have been tabulated (tables 1 and 2). The results in treatment of the psychoneuroses may first be considered. There is in these various reports a general agreement as to the rate of improvement from therapy of the psychoneuroses which falls within the range of 55 to 76 per cent with one exception. The figure given by Landis and Hinsie of a total of 87 per cent showing improvement is the highest noted in the literature. It is based on condition at discharge from a state hospital and does not include a follow-up study. The reports using more carefully defined criteria for "recovered" and "much improved" show generally a smaller proportion of cases in these categories. In reviewing Knight's summary of results from various psychoanalytic sources, the figure tabulated on the basis of all cases beginning treatment is 66 per cent. If only those cases which continued in treatment six months or longer are considered, the improvement rate, without follow-up, becomes 92 per cent.

The results in the treatment of the schizophrenias from various clinics before the introduction of insulin, electric shock and brain surgery show a general agreement as to an improvement rate approximating 40 per cent. Exceptions are noted in the Berlin Psychoanalytic Institute report of 25 per cent with improvement and the Menninger Clinic's smaller group of 14

TABLE 1

Results in treatment of the psychoneuroses

AUTHOR AND SOURCE OF MATERIAL	NO. OF CASES	% "RECOVERED" OR "MUCH IMPROVED"	% IMPROVED	TOTAL % IMPROVED	FOLLOW-UP INTERVAL
					yrs.
Coon and Raymond, 1940, Stockbridge (1910–1934)	1060	29.9	27.6	57.5	1–20
Carmichael and Masserman, 1939, U. of Chicago Clinics (1935–1937)	66	35	20	55	1–2
Luff and Garrod, 1935, Tavistock Clinic (1928–1931)	355	31	28	59	3
Ross, 1936, Cassel Hospital (1921–1933)	1186	45	25	70	1
Cobb, 1950, Massachusetts General (1933–1948)	200	31	45	76	1–10
Hamilton, Varney and Wall, 1942; and Hamilton and Wall, 1942, New York Hospital (1927–1937)	200	59	17	76	4–15
Miles, Barrabee, and Finesinger, 1951, Massachusetts General (1935–1947)	62	23	35	58	2–12
Knight, 1941, Reports of various psychoanalytic sources (1920–1937)	534	45	21	66	—
Fenichel, 1934, Berlin Psychoanalytic Institute (1920–1930)	312	40	18	58	—
Bond and Braceland, 1937, Pennsylvania Hospital (1927–1928)	37	57	19	76	5
Hinsie and Landis, 1937, N. Y. Psychiatric Institute (1930–1935)	119	40	47	87	—
Average percentage with improvement				67	

TABLE 2

Results in treatment of the schizophrenias

SOURCE OF MATERIAL AND AUTHOR	NO. OF CASES	% "RECOVERED" OR "MUCH IMPROVED"	% "IMPROVED"	TOTAL % WITH IMPROVEMENT
Berlin Psychoanalytic Inst., Fenichel, 1934	45	7	18	25
N. Y. Psychiatric Inst., Hinsie, 1937	180	12	34	46
Pennsylvania Hospital, Bond and Braceland, 1937	103	12	24	36
New York Hospital, Cheney and Drewey, 1938	500	21	16	37
Henry Phipps Clinic, Rennie, 1939	500	11.9	30.1	42
Iowa State Psychopathic Hospital, Malamud and Render 1939	309	26	11	37
Menninger Clinic, Knight, 1941	14	43	7	50
Average percentage with improvement				39

cases of whom five discontinued treatment, and of the remaining nine, 7 showed improvement.

Statistical information of the results obtained by the groups working with intensive psychotherapy in schizophrenia is not as yet complete. The following information has been supplied to us. A preliminary study by Bullard, Stanton and Schwartz of the results of treatment at Chestnut Lodge from 1944 to 1949 indicates an overall improvement rate of 41 per cent in a group of 139 schizophrenic patients, two thirds of whom had been ill more than two years. Rosen, in an as yet unpublished follow-up survey of 37 patients previously reported, finds that 22 have remained well and five have maintained their existence outside the hospital, requiring treatment from time to time.

It is striking that individual reports from various sources show such little variation from the average improvement rate of 67 per cent in the psychoneuroses and 39 per cent in the schizophrenic illnesses. The wide variety of treatment methods encompassed in these studies shows very similar results. The methods of therapy have included direct reassurance, persuasion, suggestion, hypnosis, re-education, hospital routines, occupational therapy, insight therapy, distributive analysis and psychoanalysis.

Some general remarks need to be made about the significance of these figures, regarding especially the variables of *selection*, the description of *treatment* and the criteria of *improvement*.

There is always some *selection* of patients for therapy. The number of psychoneurotics, for instance, who never reach the psychiatrist is larger than those who do. The samples that psychiatrists work with may not be typical of the larger universe of psychiatric illness in the community. This raises the question of how much we know of the natural history of the great majority of these illnesses. It raises the question of the validity of broad generalizations about psychotherapy. A similar problem arises with regard to diagnosis and psychiatric terminology. Diagnostic categories are variable and often appear to be ill-defined.

The selection of patients is made on the basis of many variables which include propinquity to treatment facilities, economic status, general education and education in medical matters, cultural and social pressures, age, intelligence, motivation to therapy, and very often on the evaluation of suitability for treatment and prognosis. The group traditionally treated by psychoanalysts is apparently the most specially selected.

The *type of treatment* and the nature of the therapeutic influence on the patient are of importance in evaluating the effectiveness of therapy. There is a general lack of useful information about these matters. For the patients treated in Stockbridge under Dr. Riggs and in the psychoanalytic institutes the methods of therapy are most clearly defined. For the larger

group of patients, it is difficult to delineate the type of therapy other than to call it general psychotherapy. It is not possible from these studies to derive information as to the nature, quality and process of the emotional interaction.

It is in respect to the *criteria* of *improvement* that the figures of various authors are least comparable. The statistics now available are based on widely different standards, with only infrequent attempts to define the criteria used for such descriptions as "cured" and "recovered", "much improved", "pronounced improvement" and "slightly improved". Follow-up studies range from a few months to twenty years, with differing methods of obtaining data; in one instance by questionnaire and inquiry of relatives, in another by patient interview with the psychiatrist who originally studied the cases. Better data are needed on the quality and the duration of improvement.

A review of these statistical reports shows that improvement takes place in roughly 67 per cent of psychoneurotic and 39 per cent of schizophrenic patients. Selection, variability of diagnosis, lack of uniformity and precision in the criteria of improvement, and the absence of adequate information as regards treatment procedures in the great majority of patients, make the validity of comparison between different methods of treatment difficult and doubtful. It is sometimes stated that the more severe cases come to psychoanalysis. Statistical reports usually make no statement as to the severity of the illness, the depth of the psychopathology, previous attempts at therapy, or the psychiatrist's evaluation of prognosis. Statements as to these matters would make reports more valuable.

In addition, attention should be called to the fact that of the eighteen studies of results of therapy presented, fifteen of them surveyed cases treated between 1910 and 1939. Presumably procedures for treatment have changed in recent years. Have we reason to hope that results would be improved?

DISCUSSION

Similarity of results from different psychotherapeutic approaches

From the statistics presented and from personal observation of psychotherapists with differences in theoretical approach, one is impressed by the similarity of results. It is striking that such varied frameworks of reference do not produce more clearly different effects. What does this mean?

There seem to be two possible conclusions. Different types of psychotherapy are approximately equal in effect because either (1) psychotherapy has no effect on the patient, or (2) the non-specific and common elements of the different types of treatment grossly outweigh the individual differences.

The first possibility, that psychotherapy has no effect, raises vital ques-

tions. Is there an underlying pathological process which is untouched and uninfluenced by therapy? Would all the cases have shown the same recovery rate had no therapist been seen and no therapy instituted? Does the whole idea of the usefulness of psychotherapy merely fulfill the therapist's need to feel secure, to feel that he is doing something, or to satisfy his need for power and domination? We know of no statistics concerning the spontaneous course of these reactions which can be used to refute this possibility. This would in essence deny that the patient can be influenced by psychological means, deny that his anxieties can be aroused or allayed by the doings, feelings or sayings of the therapist. This is contrary to experience.

The second and more probable conclusion is then that the *common features* of the various types of psychotherapy are of far greater importance than the individual differences. The non-specific elements of therapy seem to be more important than the intellectual formulations the therapist uses. Therapy is more basic than our theories.

Common denominators in psychotherapy

What then are the common denominators of the different therapies? Fiedler, in his investigations of the therapy carried on by experts of Freudian, Adlerian and non-directive schools (the therapists being anonymous to the investigator) has reported that the therapist of one school does not create a relationship characteristically different from that of the two other schools. Also, he reported that they were less able to detect differences in procedure between the different expert therapists than between the expert and the novice of the same school.

In our opinion the basic psychodynamic element common to the various therapies seems to be the emotional aspect of the patient-therapist relationship, for it is within this that psychotherapy takes place.

Common features of this relationship seem to be the following:

First, there is a patient *needing help*, often seeking help, and a therapist who is *desirous of helping* the patient to a better adjustment. It is important that the *patient desires to change*. Apparently the greater the motivation the better the prognosis, for where motivation for change is minimal as in the hebephrenic type of schizophrenic reaction, or in the anxiety- and guilt-free overt homosexual, we do not often effect much change. Even where the patient's desire may appear to be lacking, the doctor is there offering aid and support; he places himself in the position of extending perhaps not love, but kindness, consideration, knowledge and experience. There may be a multiplicity of reasons why the therapist wants to help. However, for the patient, his willingness to help may be the more important factor, and for the patient this can be a vital experience. As one

schizophrenic said: "It isn't that you understand but that you *try* to understand."

Along with the doctor's acceptance of a patient for treatment there goes an *acceptance of the patient as a person*, as an individual worthy of help, with his own hopes, fears, desires and tensions. The maladjusted person is no longer isolated; he is now a patient and a *member of a group*. As the patient relates his symptoms, he has initiated a *sharing* and a *togetherness* with someone else. He is no longer alone. If he has been guilt-laden, he may feel less worthless; if he is anxious, his fears become less threatening.

Another common feature of different types of therapy is the belief on the part of the therapist in the effectiveness of the type of therapy he is doing. Whether verbalized or not, the patient is aware of it. This is the suggestive element of all therapy and it carries to the patient a hopefulness that his adjustment can be better. We can speculate how therapy would proceed if the therapist tried to work within a theoretical framework in which he did not believe. It would be psychonoxious because the therapist would be insecure and not have a relationship of integrity with the patient. These factors would hinder the emotional interaction from progressing in a therapeutic way. This is seen in the unhappiness and ineffectiveness of young residents who are asked to work in an unaccustomed, somewhat unacceptable therapeutic frame of reference.

Furthermore, in all therapies there is an effort to influence or bring about a change in the patient, whether through authoritative direction, suggestion, reassurance, explanation, understanding, insight (which is formulated in different terms according to the understanding and intellectual frame of reference of the therapist). Differences in therapy largely depend on the use and type of emotional relationship that is developed through the therapist's guidance and the type and depth of intellectual understanding employed.

The common features of therapy have been considered and this then is the *setting* within which the psychotherapeutic process evolves: a patient and a therapist working together, one with a need for help, the other equipped with adequate technical skills and with a desire to help and with some idea that a better adjustment is possible for the patient.

In this setting certain basic needs or drives of the individual are provided for, namely 1) new experience, 2) security, 3) recognition, 4) responsiveness. If these needs are sufficiently satisfied, whether explicitly or implicitly, emotional growth can take place, for the tendency of the organism is more towards health than otherwise.

In the affective relationship between patient and therapist, our concepts of the basic *bare essentials of the therapeutic experience are:*

1. The patient experiences that the intensity and placement of many of his feelings and defense mechanisms are inappropriate, unsatisfactory and unnecessary. This unsatisfactoriness of some of his fears, hostility or unresponsiveness is experienced in relation to the doctor. He learns that his intellectual functioning, reality testing, decisions and effective action are being limited by his maladaptive techniques.

2. New feelings, new roles, new behavior arise in his relationship with the therapist and then with others. Only after a certain amount of testing, usually with much trial and error, do more healthy adjustments occur, with a release from old handicaps.

3. With continued collaboration there is increasing clarification of his motivations, of reality and of the possibilities of adjustment. Usually he becomes more able to communicate. He becomes more aware of motivating forces within himself, their development and influence. His perception of reality becomes more accurate and more in accord with the evaluations of others. He sees more clearly his own abilities and possibilities.

These operations do not necessarily proceed sequentially but more or less intermingle. The first two processes are more of an emotional nature and may be in large measure unconscious and undeliberate. The third tends to be more conscious, deliberate and intellectual.

Clarification begins with the patient's present life situation with days, weeks or months of mutual exploration and working through the defenses, impulses, feelings which the patient is using in his daily living. Then gradually and almost imperceptibly this process leads to the past — to the earlier life experiences of the patient. Through questions, the therapist helps the patient to discover and identify the roots and origins of his present behavior patterns and attitudes. He learns to recognize how these patterns have been repeated many times in many different connections and settings and have led to ineffectiveness, inappropriateness, frustration, disappointment and suffering. The repetition of past in present is felt and seen. These experiences provide a sense of origin and development which help in the integration of the patient. Gradually the patient comes to realize the dynamic relationship between past and present. Through these experiences and insights, the strength and intensity of the excessive and inappropriate impulses which have held him in their grip diminish more and more, and dammed-up energies from the past are released for constructive use. It is our observation that it is primarily the living experience in relationship with the skilled therapist that makes it possible for this growth and improvement to take place. Mere intellectual formulation and interpretation do not produce it. Skill in a therapist consists in the understanding of the psychodynamics of the patient's condition and, in addition, using this

understanding in providing for the emotional growth of the patient. There is a great deal of psychodynamic understanding involved in providing opportunities for emotional growth. This is an area which deserves more precise investigation.

Psychodynamics is the basis of modern psychotherapy. The therapist should understand the patient dynamically in the light of his history. This means that childhood experience and conditioning are fundamental factors molding motivations and personality organization, leading ultimately to the development of the psychiatric illness. To modify handicapping motivations and personality disorganizations, new experience, deconditioning and reconditioning, is necessary. Affective elements and changes as well as intellectual processes are involved in this experience. They are intermingled. They are both psychodynamic factors.

Many patients have to be treated with minimal utilization of clarification on their part but this treatment can, nevertheless, be reasonably successful. Such psychotherapeutic experiences may be compared to normal growth and development of the child where major strides toward maturation appear long before intellectual formulations occur.

With some patients perhaps highly selected on the basis of motivation for help, higher intelligence, economic status, and ability to cooperate with a relatively fixed and strenuous treatment regime, the therapeutic process may take place within the formulations of the theory and practice of psychoanalysis as more rigidly defined. But here also intellectual insight or understanding is of little effect unless accompanied by emotional change. The patient experiences the inappropriateness and unsatisfactoriness of his transferences toward the doctor. This experience liberates the patient's tendencies toward health and also activates feelings which reinforce appropriate responses.

Where therapy is carried on with little awareness on the part of the therapist of the basic needs of an individual and particularly the need for new corrective experience, it is the general tendency toward health which perhaps chiefly accounts for improvement. Growth-productive experiences for the patient then are fortuitous and may be few and far between. If, however, the therapist concerns himself with searching out the needs of the individual patient, and his basic motivations, it is probable that the distortions in interpersonal relationships (transference or parataxic) can be modified more rapidly, and significantly important, new emotional experiences occur sooner, so that emotional growth is accelerated. The therapist cannot develop too much insight into the patient's personality and its development. However, there is a danger that he may try to "give" his insight to the patient, with the misconception that this insight alone is

curative. Rather, his understanding should be used to provide new corrective experience for the patient. Eventually, however, the patient is more secure if he develops insight.

Perhaps the greatest psychotherapeutic challenge in psychiatry is the treatment of the schizophrenic patient. The physical methods have so far not turned out to be the whole answer. Although classical psychoanalysis has taught that its methods are therapeutically ineffective in the narcissistic neuroses, there have been modifications in the psychoanalytic technique recently by Fromm-Reichmann, Rosen and Sechehaye. They have gained an entering wedge into the psychotherapy of schizophrenia with some success. The significant points are that modifications of psychoanalysis can be made, and these modifications appear to be effective in some conditions where classical analysis, as more narrowly conceived, is not.

There are wide variations and differences in people and in the reactions they bring to treatment. No one type of approach is best for all. Although one notes a regrettable tendency among many psychiatrists to adopt a stereotyped therapy, treatment to be helpful should be individualized in terms of the individual patient. The therapist must be flexible in his attitude, working level, time, duration and frequency of interview. It cannot be expected that the same strategy and tactics will produce similar change in an anxiety reaction, obsessive-compulsive reaction, and a schizophrenic reaction, nor even that the same tactics will be equally effective in different patients with the same reaction type. Terms such as superficial, deep, brief, prolonged, are not too helpful, neither are insight, analytic, relationship, abreactive or uncovering. The point is: is the therapy appropriate and effective? Does the therapist provide the conditions and experiences for emotional change toward health? Is there basic or psychodynamic understanding (especially by the doctor) of motivation and personality development?

Relative status of knowledge in psychiatry

Symptoms	+++++
Defense mechanisms	++++
Diagnosis	+++
Dynamics	+++
Prognosis	++½
Psychotherapy	++½
Etiology	++
Physical pathology (neuroanatomy, neurophysiology, neuropathology)	+
Natural history of reaction types	?

Desirable additions in knowledge

In conclusion of this discussion, it is clear that more questions are raised than are answered. The chart indicates our visualization of the rela-

tive status of our knowledge with regard to different aspects of psychiatry at the present time. This represents a challenge to psychiatry and indicates many problems for further study. The observations and inferences drawn in this paper do not lend themselves to dogmatism. One feels the need for collaboration, more precise delineation and more careful scrutiny of processes and results.

BIBLIOGRAPHY

1. Alexander, F. and French, T. M.: Psychoanalytic Therapy. The Ronald Press Co., New York, 1946.
2. Appel, K. E.: Psychiatric therapy. In Hunt, J. McV.: Personality and the Behavior Disorders. The Ronald Press Co., New York, 1944.
3. Appel, K. E.: The differentiation of psychosis and psychoneurosis. Clinics, Dec. 1942, 807 841. B. Lippincott Co., Philadelphia, Pa.
4. Bond, E. D. and Braceland, F. J.: Prognosis in mental disease. Am. J. Psychiat., *94:* 263, 1937.
5. Carmichael, H. T. and Masserman, J. H.: Results of treatment in a psychiatric outpatient department. J. Am. Med. Ass., *113:* 2292, 1939.
6. Cheney, C. O. and Drewry, P. H.: Results of non-specific treatment of dementia praecox. Am. J. Psychiat., *95:* 203, 1938.
7. Cobb, S.: Treatment of psychoneurosis and results of follow-up study. Monatschr. f. Psychiat. u. Neurol., *120:* 5 6, 1950.
8. Coon, G. P. and Raymond, A.: A Review of the Psychoneuroses at Stockbridge. Austen Riggs Foundation, Stockbridge, Mass., 1940.
9. Diethelm, O.: Treatment in Psychiatry. Charles C Thomas, Springfield, Ill., 1950.
10. Fenichel, O.: Ten years of the Berlin Psychoanalytic Institute, 1920–1930, Report of therapeutic results.
11. Fiedler, Fred E.: Factor analyses of psychoanalytic, nondirective, and Adlerian therapeutic relationships. J. Consult. Psychol., *15:* 32 38, Feb. 1951.
12. Freud, S.: Outline of Psychoanalysis. W. W. Norton and Co., New York, 1949.
13. Fromm-Reichmann, F.: Principles of Intensive Psychotherapy. Univ. of Chicago Press, 1950.
14. Hamilton, D. M., Varney, H. I. and Wall, J. H.: Hospital treatment of patients with psychoneurotic disorders. Am. J. Psychiat., *99:* 243, 1942.
15. Hamilton, D. M. and Wall, J. H.: Hospital treatment of patients with psychoneurotic disorders. Am. J. Psychiat., *98:* 551, 1942.
16. Hinsie, L. E.: Concepts and Problems of Psychotherapy. Columbia Univ. Press, New York, 1937.
17. Knight, R. P.: Evaluation of the results of psychoanalytic therapy. Am. J. Psychiat., *98:* 434, 1941.
18. Luff, M. C. and Garrod, M.: The after results of psychotherapy in 500 adult cases. Brit. M. J., *2:* 54, 1935.
19. Malamud, W. and Render, N.: Course and prognosis in schizophrenia. Amer. J. Psychiat., *95:* 1039, 1939.
20. Miles, H. H. W., Barrabee, E. and Finesinger, J. E.: Evaluation of psychotherapy. Psychosom. Med., *13:* 83, 1951.
21. Rennie, T. A. C.: Prognosis, follow-up study of 500 patients with schizophrenia admitted to hospital from 1913 to 1923. Arch. Neurol. Psychiat., *42:* 877, 1939.
22. Rogers, C. R.: Client-Centered Therapy. New York, Houghton Mifflin Co., 1951.

23. Rosen, J. N.: The treatment of schizophrenic psychosis by direct analytic therapy. Psychiat. Quart., *20:* 1, 1947.
24. Ross, T. A.: An Enquiry into Prognosis in the Neuroses. Cambridge University Press, London, 1936.
25. Sechehaye, Marguerite: Symbolic Realization. Int. Univ. Press., New York, 1951.
26. Whitehorn, John C.: Psychotherapy. In Harris, N. G.: Modern Trends in Psychological Medicine. Paul B. Hoeber, Inc., New York, 1948.
27. Bullard, D., Stanton, A. H., and Schwartz. Personal communication, December, 1951.
28. Rosen, John N.: Personal communication, December, 1951.

SUMMARY OF PAPERS I TO IV

DR. MAURICE LEVINE, *Cincinnati*

We have in these four papers an excellent introduction to the topic of the day—papers that are broadly conceived, individually expressed, and provocative of active discussion.

Dr. Whitehorn gives an excellent summary of some of the basic issues in therapy, and stresses the concept of the therapist interposing himself in the interplay of dynamic forces in the patient and his environment, rather than as a fighter against an attacking disease. With such a reorientation I think most of us would be in agreement. In addition, his paper essentially is a broad-based plea for a melioristic approach rather than a curative approach in the field of psychiatry. It is a convincing argument against what in his paper (the draft which was sent to me) he calls "the over-eager therapist, who scorns the humble task of caring for patients and must obsessively be forever curing his patients, to feel worthwhile." Dr. Whitehorn with characteristic astuteness puts his finger on a frequent enough neurotic mistake in the practice of psychiatry. However, I would think that a comparable strong case could be made out for the frequency of the opposite mistake, of a listless rather than over-eager approach, of an undue passivity, of setting goals too low, of using the melioristic approach as a rationalization. In fact, I would hesitate seriously in making the melioristic attitude the cornerstone of an approach to therapy and would rather think in terms of both an overeagerness to cure, and of a hesitation to be curative enough, as potential manifestations of counter-transference, as ways in which the individual personality of the psychiatrist may modify his handling of the individual patient. It would be my impression that the whole practical problem of the setting of goals in therapy in psychiatry involves to an extraordinary degree the problem of countertransference, and that the psychiatrist and a supervisor in a training center must emphasize this factor with great frequency.

In essence, my comment would be that in the problem of therapeutic goals and therapeutic strategy, it is of limited significance to decide whether one should have in general a melioristic or a curative approach about an entire field which is complex and diversified. Rather I would want to emphasize that such attitudes are really to be decided in individual cases, or with regard to groups of patients or reaction-types, and further that we

can begin to see that in each individual case therapeutic goals and the therapeutic strategy must be dependent on such factors as (1) the clinical diagnosis; (2) the dynamic diagnosis, in which there would be an estimate of many items, of ego strength, of the areas of conflict and their intensity, the possibility of hidden psychotic nuclei in neurotic patients, the situation in which the patient lives or will return, his motivation with regard to being helped in therapy, the flexibility of his defenses, etc.; (3) a genetic diagnosis, in which a major part of the problem of therapeutic goals and therapeutic strategy rotates around such problems as fixation versus regression, and the kind and degree of healthy and unhealthy identifications in childhood. Such factors would then determine the choice of melioristic or of curative goals.

Dr. Zubin's paper is thoughtful and well-balanced—a plea for basic controlled statistical study, of the outcome of psychiatric therapy. It contains the productive suggestion of fitting the experimental group to available controls, rather than trying to create a control group for each experiment.

It contains also an excellent summary of the fact that so-called specific therapies as contrasted with non-specific therapies yield a better immediate outcome but no better eventual outcome.

I would question several points. One is Dr. Zubin's identification of total-push therapy with non-specific therapy, and his conception of it as providing a reliable baseline. It seems to me that such therapy in practice is quite variable. Certainly it is a reasonable hypothesis that a period of occupational therapy, as part of total push, with one type of therapist, might well be a totally different experience from occupational therapy with another type of therapist—and unless such a clear-cut evaluation of the baseline is available, statistical results may have a shaky foundation. It would leave untouched what many of us would consider a basic element in psychiatric therapy, namely the relationship of therapists with patients.

My chief objection to the paper is of course the choice of the title, namely "Design for Research in Therapy". This is far too broad a title for such a paper, which essentially is a design for research in evaluating outcome in therapy and does not cover the problem of designing a new research approach in therapy or of investigating a new approach in a single case or in a small group of cases. The design as expressed is one for a definitive cross-checking of previous research in therapy. Still further the paper, as given, mentions only one type of research on outcome of therapy and ignores the possibility of a different kind of research in the outcome of therapy, in which a more microscopic study of the process of improvement in an individual patient or a small number of patients would be the focus of attention, and in which for example the research might focus on the validation of prediction of improvement when a specific variable had been changed.

These essentially, however, are minor criticisms. Within the planned framework of the paper, it gives a clear conception of ways in which such research designs should be improved.

Dr. Alexander's paper, which I read today in his absence, deserves more careful study for a considered comment. My first reaction is that it may prove historically to be an important paper, in that it avoids the overstatements that marked the famous book: *Psychoanalytic Therapy*, and makes a differentiation of briefer from longer procedures that is far more acceptable to other psychoanalysts, and can pave the way for a less heated discussion of basic issues.

The paper by Dr. Appel and his group is a sincere and conscientious attempt to come to grips with the process of psychotherapy and certainly brings out with great clarity a point implicit in the other three papers as well—that psychiatry, vigorous as it is, is young and uncertain in many ways and only at the beginning of research that must be careful, well planned, adequately reported and verified, and then provocative of further research and eventual clarification.

DISCUSSION

Dr. Oskar Diethelm [New York, N. Y.]: I should like to ask for some clarification.

For instance, in Dr. Zubin's paper, when he speaks of specific and nonspecific therapy, he probably refers to therapy and not to etiology. In the literature the terms as used are confusing to me.

I am sorry Dr. Alexander is not here. I should like to know whether I understood him correctly, whether he means more is known psychopathologically about psychoneuroses than about other psychiatric disorders. This would be a surprising statement to me, considering the progress of psychopathology, especially in the field of schizophrenia and more recently in the field of depressions.

I also wonder whether the evaluation of the treatment he discussed might not have been somewhat clearer if he had brought out the goals of psychotherapy, especially psychoanalytic therapy, which were discussed in the London group and published in the *International Journal of Psycho-Analysis*. I do not have the impression that it is primarily a problem of semantics, but rather that it is something of much more fundamental importance.

I was very much interested in Dr. Zubin's presentation. I realize his final statement is an idealistic one, but we cannot do research work with idealism. I wonder how his presentation would fit in with the work on treatment of schizophrenia mentioned by Dr. Appel.

Dr. D. Ewen Cameron [Montreal, Canada]: Mr. Chairman, Ladies and Gentlemen: I should also like to comment upon Dr. Zubin's paper, because it is in some sense a very key matter of this whole question of experimental design. Discussions of this kind have come up many, many times before in our various meetings, and I am going to say very frankly that I do feel, as far as Dr. Zubin's paper is concerned, that what one sees here is an attempt, a valiant attempt, no doubt, but an attempt to transfer to our field a system of experimental design, designed experimentation, shall we say a philosophy of science, which really has its applicability in other fields altogether. I don't think we have frankly accepted the fact that our data are intensely variable, that we are dealing with emergent situations and not static

situations. We are trying, therefore, to say this is how something should be in our field rather than how something is in our field of research.

It is a little bit like the pre-Elton Mayo industrial researchers who went into industry and said, "Well, now, we know perfectly well that orders ought to come down from the president to the vice president and on down to the foreman and finally on to the man who does the work." But actually, as we now know, things work differently. Those early workers applied a sort of deterministic idea to research in industry and said that when you have more illumination, more output should result; that if you gave more money to a worker, then he would do better. Actuality is quite at variance with that.

I am going to suggest here—and I should like to get Dr. Zubin's reaction to this—that what we have to do in approaching research in our field is really to make a fundamental shift in our whole basic premise. Our basic premise concerning science at the present time makes it something like a system, a system which exists more or less in its own right and can be operated by any reasonably intelligent person. Actually I am going to suggest that while it may be a profitable enough idea in certain fields, it is not profitable for us, and we would do much better to see science as a form of behavior.

We may say simply this: that scientific activity is going on continually in our field, that we are getting results, that we are evolving therapies. And if we could settle down to the study of how we do it, I think we would get much better answers than if we went on trying to apply a system which really does not belong to us.

I cannot make any very provocative comments, I am afraid, on how we do it, but I simply would say that all of us who over the past three decades have tried to evolve new therapies or tried to apply new ideas have found that we have started out with an idea, we have worked with it for a while, and we have abandoned it or occasionally we have accepted it. I am pretty sure we have not used controls in this sense that Dr. Zubin has suggested to us.

So if I might finalize what I am saying, it is this: I think if we can make a shift from trying to see science as a system to seeing science as a form of behavior carried out by scientists, and if we can study not the application of a system but rather the matter of the scientist in action with his data, we will get what we are looking for so vainly at the present time—the criteria of proof.

President Wortis: Thank you, Dr. Cameron.

I am going to read two questions sent up from the floor. One is from Dr. Denker and is directed to Dr. Appel. It reads:

"How do you reconcile your statement that the therapist's psychodynamic understanding of the patient's situation is the most important when the therapeutic results you showed were no different whether the patients were treated psychoanalytically, supportively, or, as in a study of mine of 400 cases, by general practitioners with a similar therapeutic result of 60 to 70 per cent over a five-year follow-up period?"

The second question is directed by Dr. Max H. Weinberg to Dr. Zubin, and reads:

"What could a commission do in the standardization of cases when we are dealing with reaction of the individual patient to the vicissitudes of life?"

Dr. Lothar B. Kalinowsky [New York, N. Y.]: I would like to emphasize the importance of Dr. Zubin's paper. I would regret it if the well taken criticism of some points by other discussants—and I could add some more critical remarks—would discourage us from finally getting started on some program to evaluate treatments. Dr. Zubin himself called his paper idealistic, and I think many of his own requirements for statistical evaluation of treatments could be reduced a bit. Several hospitals can be used because, contrary to the occasionally heard statement, the material of the large mental institutions in this country as well as abroad

is quite homogenous, and at least in 80 or 90 per cent the case material will be identically diagnosed.

There are many things which could be studied as, for instance, comparison between several competing methods for the same type of disease. This could be done very easily, whereas a full evaluation of the ratio between treated and nontreated cases is more difficult since nowadays most cases receive some kind of treatment. It should be emphasized, however, that any studies evaluating treatments are promising only when the statistician with his approach and an experienced therapist get together. Only the psychiatrist can diagnose, treat and evaluate the material and help the statistician to avoid the many possible pitfalls of such work. We have many instances where statistical papers came to completely erroneous conclusions, while on the other hand, the clinician often neglects the statistical requirements. So I think it is only through planning by both the statistician and the experienced psychiatrist that results can be achieved.

Dr. John C. Whitehorn: Perhaps my most significant remark would be in the nature of an apology to Dr. Levine since, as some of you may have noticed, the quotation which he read was not in the paper. It was in a preliminary draft. I thought myself that the passage in question might have weighted the discussion somewhat too heavily in the direction of a specific melioristic approach, and therefore took it out. He and I apparently are in agreement that it would be an unfortunate thing to seem to argue only for a melioristic approach.

What I would wish to get across is that many persons who frankly work for melioristic goals in the therapy of psychiatric patients have a respectable basis for working that way and need not feel they are a lesser breed of psychiatrists because their ambitions are, in certain instances, more restrained.

Dr. Joseph Zubin: I am grateful to Dr. Maurice Levine for his kind and incisive criticism.

"Total push" to be sure, covers a great variety of specific therapies, but if the suggested plan is followed, it will soon become apparent that the different varieties of "total push" may have certain elements in common. The individuality of the "total push" therapist will no doubt make itself felt in the outcome, but certain statistical controls can be used to eliminate these individual differences in "total push". Otherwise, no base-line study is possible, since no matter what non-specific treatment is meted out to the patient, differences in it will occur from ward to ward or from hospital to hospital. These differences can be removed, however, by statistical analysis.

The objection to the title of this paper is also well taken. The title as well as the contents have undergone several metamorphoses, but I think it will please Dr. Levine to note that the final title: "Design for the Evaluation of Therapy" meets most of his objections.

The need for studying the process of therapy itself and the need for isolating the effective common agent or underlying factor in all the therapies, if one exists, is, of course, one of the major issues in therapy. The much neglected work of Prinzhorn[1] in this area merits more attention than it is now getting.

Dr. Cameron's question regarding the nature of the scientific method raises, of course, a problem that I can hardly cover within the allotted two minutes. I only want to say that science progresses, rather than regresses, by borrowing from other fields. Einstein's contribution to knowledge derived at least in part from his borrowing a very simple concept from psychology, namely, the observer. We should not be loath to borrow from other fields as long as the concepts borrowed prove useful.

[1] Prinzhorn, Hans: Psychotherapy (its nature its assumptions its limitations, a search for essentials). Translated by Arnold Eiloart from German Edition, 1929. Jonathan Cape, Thirty Bedford Square, London 1932.

The entire question of criteria of proof which Dr. Cameron raises hinges upon the selection of a proper model for evaluating our hypotheses regarding the goals, methods and expected outcome of therapy. Perhaps the model which I propose—based essentially on the model utilized in other chronic diseases—will prove insufficient and will have to be modified. Only by trial and error in model selection can we approach more and more closely to the evaluation of our hypotheses. In fact, the hypotheses on which the model is based need not be true at all, and yet it may leave a heritage of much scientific value after it is discarded. Witness the scientific after-effects of the hypotheses of phlogiston, phrenology, focal infection etc. Without any model whatsoever we flounder from hunch to hunch and end with improvement rates no greater than the spontaneous rates.

Regarding the question of stressing the process of therapy itself, if we follow the standard control approach, we will soon find that the same treatment in different places leads to different outcome. Such a comparison will immediately raise the question of how the therapy is carried on. Insulin therapy, for example, is not given in the same way in various places, and the results of comparing outcome of insulin therapy with control groups in different parts of the country will bring out the differences in how the method is applied.

Dr. Weinberg's question on how can we ever get a comparable control group if patients simply represent a reaction to the vicissitudes of life, I can only counter by saying that there must be a common element in the response of the organism, to these vicissitudes of life, or we would not have categories today which seem to work for classification as well as for treatment. It seems to me that to say there is no possibility of classification at all is to deny any scientific approach in this field.

Dr. Kalinowsky's comments are well taken. If both the standard population and several types of treatment could be launched in the same hospital, that would be ideal. But like all idealistic approaches it would be very difficult to carry out. On the collaboration between clinician and statistician, I am in full agreement. Statistician is perhaps not a well chosen word since it is so closely tied-in with static. Perhaps biometrician is a better term for the professional man engaged in evaluating the well being and changes in well being of mental patients. Biometricians are needed not only to evaluate data after they are collected, but in the planning, execution as well as evaluation of the research design.

Dr. Diethelm's inquiry on how the suggested standard control group method would fit in with the treatment of schizophrenia mentioned by Dr. Appel is difficult to answer. I think that it would serve its purpose there very well. If psychotherapy with schizophrenics is feasible, its effects should stand out boldly against any results obtained in the standard control group.

About the general criticism that has been raised by Dr. Diethelm and others with reference to the idealism of this approach, I have only one comment to make. Twenty years ago cancer was in a much worse state than we are in today. In twenty years' time, by applying scientific methods, cancer research has jumped far ahead of us—not because they have more funds or more facilities, but because they have been, shall we say, naive enough to follow the path of science in evaluating the outsome of their particular therapies. I think if we followed the scientific approach, we could do worse.

Dr. Kenneth E. Appel: In regard to Dr. Denker's question, we have not considered his reports from the insurance companies because of the difficulties in diagnosis, the fact that diagnosis was made by general practitioners, and because of the question of follow-up. We felt that the follow up was not adequately taken care of for the purposes of our discussion.

The chief point that I wanted to leave was this: that it seems to me the *affective* relationship between the therapist and the patient needs more study and is amenable to psychological investigation even of a statistical nature. My experience points up the relative impotence of

merely dogmatic *intellectual* formulations of psychodynamics as levers of psycho-therapy, which so often leave a patient in the same situation as he was before.

Dr. Denker's question is well taken and helps to elucidate our understanding of the status of the problem. It is necessary to distinguish between what statistical surveys of the results of treatment fail to prove and what they might be assumed to prove in a positive way. Statistical studies *have failed to show* any significant difference in the favorable results produced by one method of therapy as compared with others. They *do not prove* that there *is no difference* in the effectiveness of different therapeutic methods, or that all methods and all elements of therapy (suggestion, insight, new experience) are equally effective in all cases at all times. As we have attempted to set forth, the statistical studies of the results of therapy are not comparable. In such statistically masked patient groups the individual differences of the various types of therapy cannot be appreciated, and the significance of common elements in various therapeutic approaches is emphasized. We wish to make it clear, however, that in acknowledging the common and basic elements of different therapies we are far from denying the importance of the therapist's understanding the patient—whether he employs techniques described as analytic, abreactive, non-directive, superficial, or prolonged, etc. We must still look to the future to teach us when the various therapies are indicated.

Dr. Wortis: On behalf of the Association and the Commission I want to thank those who read papers and those who summarized and discussed these contributions.

Section II

CHAPTER V

RECENT ADVANCES OF PSYCHOANALYTIC THERAPY

SANDOR RADO

Freud's motivational theory of behavior, known as classical psychodynamics, is the basis of the classical technique of psychoanalytic therapy. Adaptational psychodynamics, a consistent development of the classical theory, seeks to place the analysis of behavior on a sound biological foundation, and to depict motivation in a close-to-the-fact language that facilitates its clinical verification. This revised theory sheds new light on the therapeutic mechanisms by which the various treatment procedures operate, discloses the imperfections of the classical technique as well as its lasting achievements, and leads to the development of a new technique of psychoanalytic therapy which I call the adaptational technique.

Limiting the scope of my assignment to this line of recent development, in the present paper I shall introduce a conceptual scheme for the comparative study of diverse psychotherapeutic methods, take a fresh view of the chief therapeutic ideas evolved in the past, outline the new adaptational technique and finally glance at the problems that lie ahead.

THE CONCEPTUAL SCHEME

Psychotherapy is a medical procedure; it may be defined as the use of human influence for the treatment of behavior disorders. We distinguish between the patient's *treatment behavior* and his *life performance*. The term treatment behavior refers to his co-operation with the physician; the term life performance, to the rest of his activities in daily life.

The patient's treatment behavior can be understood only in terms of his own shifting *designs for co-operation* whether he is aware of them or not. The various designs for co-operation encountered in our patients fall into a hierarchically ordered scheme of levels; this order is shown in table 3.

These designs for co-operation are subject to complications. For example, instead of co-operating the patient may wish to take the place of the physician; or he may be divided against himself and secretly prefer to

stay ill. However, such complications do not affect the validity of our hierarchical scheme.

TABLE 3

Hierarchic order of the patient's designs for co-operation

ASPIRING Level: Available only in the adult who is capable and desirous of self-advancement by extensive learning and maturation.	"I am delighted to co-operate with the doctor. This is my opportunity to learn how to make full use of all my potential resources for adaptive growth."
↑ ↓	
SELF-RELIANT Level: Available in the average adult who is capable of learning the simple know-how of daily life.	"I am ready to co-operate with the doctor. I must learn how to help myself and do things for myself."
↓	
Adult / Child-like	
↑	
PARENTIFYING Level: When the adult feels like a helpless child, he seeks parental help and therefore parentifies the therapist.	"I don't know what the doctor expects of me. I couldn't do it anyway. He should cure me by *his* effort."
↑ ↓	
MAGIC-CRAVING Level: The completely discouraged adult retreats to the hope that the parentified therapist will do miracles for him.	"The doctor must not only cure me, he must do everything for me—by magic."

↑ = advance. ↓ = regression.

At the self-reliant and aspiring levels the patient's treatment behavior is based on common sense. In contrast, at the parentifying and magic-craving levels his treatment behavior reveals excessive emotional dependence on the physician, befitting a child more than an adult. Often unknown to himself he sees in the physician an idealized re-incarnation of his own

parent, brought back to the scene by the power of his desire. Accordingly, his co-operation aims at obtaining the privileges of a favorite child, not at learning and maturation. Thus in our hierarchical scheme the sharp dividing line runs between the self-reliant and parentifying levels: above this line the patient's co-operation is adult, below it, child-like.

While the aspiring and self-reliant levels are not available in every patient, proneness of the helpless adult to regress to parentifying or magic-craving behavior is ineradicable and universal.

The fundamental clinical fact is that patients can be successfully treated at every level of treatment behavior. However, the goals and techniques of treatment are so different from level to level that it becomes an important technical task to counteract the patient's inclination to shift from one level to another, in particular, to cross the line that divides the levels of adult co-operation from the levels of child-like co-operation.

The physician must seek to stabilize the patient's co-operation at the level selected for his treatment. For this purpose he uses measures devised to regulate the patient's treatment behavior; we call these *priming measures*. In contradistinction, we call the measures devised to modify the patient's life performance *modifying measures*. Measures intended to prime and modify at the same time are called *double duty measures*.

Each particular method of psychotherapy has its own *plan for priming* and its own *plan for modifying*. Of course, its plan for modifying depends upon its plan for priming. These two plans may be conveniently used as a basis for classification of all methods of psychotherapy.

LINEAGE OF PSYCHOTHERAPEUTIC METHODS

Comparative analysis shows that the historical development of the major psychotherapeutic methods has an inherent logical consistency. To demonstrate this instructive fact, in our re-examination of these methods we shall follow the order of their historical appearance. The lineage of psychotherapeutic methods is shown in table 4.

HYPNOTHERAPY

Priming

Hypnotherapy's plan for priming is to put the patient into a hypnotic state by taking full advantage of his craving for magical help (7, 11, 12). As a child the patient knew the ironclad rule that he must purchase the "magical" ministrations of his parents with his own obedience. When told by the physician that he should go to sleep though he is not sleepy at all, the patient senses that the ironclad rule is still in force. Hence, by the action of his own desire the patient lapses into a hypnotic state, a state of almost *automatic obedience* to the parentified physician. Far from resenting

this necessity, the patient feels hopeful, even triumphant: his dream of magical help is coming true. Therefore he will act upon the physician's orders as if acting upon his own intentions.

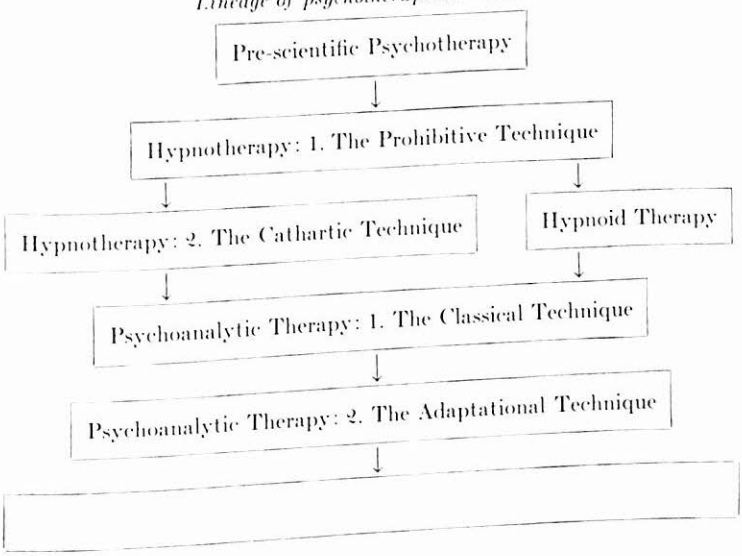
Magic-craving of the distressed is craving for security through obedience. Hypnotherapy works at the magic-craving level of treatment behavior.

1. The prohibitive technique: modifying

Having thus primed the patient for automatic obedience, the physician must decide what modifying measure to employ. He may choose the most primitive modifying measure known, the exercise of disciplinary authority. In effect, the physician tells the hypnotized patient: "Stop this nonsense! You are not ill! You feel fine!" The proper designation of this procedure is the prohibitive technique of hypnotherapy.

TABLE 4

Lineage of psychotherapeutic methods



This technique tries to cure the patient with parental discipline. Therapeutic results are obtained at the cost of increased inner tension; their collapse is only a question of time. Nonetheless, this technique may still be used to tide the patient over an emergency.

2. The cathartic technique: modifying

In 1880–82 a patient of Dr. Joseph Breuer of Vienna taught the medical profession how to make better therapeutic use of the hypnotic state. This young lady knew that hypnosis is but a means to an end: what she sought

to obtain by her almost automatic obedience was *permission to disobey*. She wished to have *her* say while under hypnosis. With Breuer's consent she revived forgotten emotional experiences, and the emotional relief freed her from her symptoms. She called this procedure "chimney sweeping". In 1893, Breuer, by then in collaboration with Freud, called it the cathartic method of hypnotherapy, or hypnocatharsis (1). In contradistinction to the prohibitive technique, it is a permissive technique, the first one to appear in scientific psychotherapy.

That the wholesale discharge of pent-up emotions has an unburdening effect has been appreciated since Aristotle. What Breuer discovered was a new and more specific therapeutic principle, but his true discovery was lost in a shuffle of unwarranted generalizations.

In a hot summer, Breuer's patient was unable to drink a drop of water because she could not touch the tumbler with her lips. Under hypnosis she related that once when she entered the room of her hated English governess, she saw the latter's "disgusting" little dog drinking out of a tumbler. She said nothing because she "wanted to be polite". Breuer describes the rest of this hypnotic session as follows:

> After she gave energetic expression to her anger, she asked for a drink, and without any inhibition drank a great deal of water, awakening from the hypnosis with the glass at her lips (1, p. 23).

This therapeutic mechanism is not an emotional purge in general, but the *release of repressed rage* in particular. This mechanism can remove only symptoms that serve as a vicarious outlet for rage *recently* repressed. The inability of Breuer's patient to touch the tumbler with her lips gave pantomimic expression to her bitter resentment of the governess: "You see what your inconsiderate action did to me! For all I know this may be the same tumbler you allowed your disgusting pet to use. How can you expect me to touch it with my lips? If I die of thirst it will be your fault."

We also learn from this case that release of rage is therapeutic only if certain additional criteria are satisfied. It was with Breuer's approval that the patient released her anger at the governess. This put an end to her humiliation, restored her pride, and assuaged her guilty fear of the governess. Had Breuer reprimanded her for her disrespect of the governess, he would have destroyed the therapeutic success. Another crucial point is that the patient felt free to recall the incident responsible for her rage. Had she feared that Breuer might criticize her, she would have remained silent or vented her anger on Breuer; in either case she would have retained her symptom.

Today we may formulate the modifying measure discovered by Breuer as follows:

The release of repressed rage is a decompressive procedure comparable to the opening of a blind abscess. To release the repressed rage, one must first locate and revive it in the memory context of the life experience that provoked it. Furthermore, to be successful, the release must retrieve the patient's lost pride; this effect can be obtained only if the patient feels that the physician approves of his released rage.

HYPNOID THERAPY

The hypnoid state is a wakeful counterpart of the hypnotic state. In the hypnoid state the patient displays a degree of *uncritical obedience* to the parentified physician, that makes him act upon the latter's propositions as if acting on his own intentions. The degree of uncritical obedience varies in a wide range. Uncritical obedience may result 1) from the patient's craving for magic, or 2) from his craving for a helpful ersatzparent, helpful in a more or less realistic sense. Thus hypnoid therapy may work 1) at the magic-craving level, or 2) at the parentifying level.

1. Priming and modifying at the magic-craving level

Magic-craving may be a fleeting episode evoked by distress in the healthy or the sick. Priming must sustain the patient's craving and belief that the physician is the person he needs. The means used may be crude or subtle; they amount to a reassuring display of what the patient believes to be the superior powers of the physician.

Modifying is done by disguised hypnoid orders; the vehicle used may be a placebo or a measure of true medical value. The magic-craving patient may supply himself with the desired hypnoid orders regardless of the physician's own intentions. This applies to all physicians and all medical procedures.

Hypnoid therapy at the magic-craving level is known as suggestive therapy or as the suggestive component of all medical procedures.

What enables the magic-craving patient to act upon the physician's hypnoid orders, whether these are explicit, implied or simply presumed by the patient? By parentifying the physician at the cost of uncritical obedience, the patient experiences an uplift, increased self-confidence and sense of emotional security; these changes relax his inhibitions, allay his fears and facilitate his life performance. Owing to the patient's own desire, the parentified physician may thus be able to induce him to do things he was unable to do by himself. However, the physician must first comfort the patient and help him to unburden himself by discharging his pent-up emotions. He may help the patient over the hump by sound advice and other supportive measures.

2. Priming and modifying at the parentifying level

Priming follows the same principles as above; but here the physician must be more subtle because the patient is more critical. As compared with the magic-craving level, here the physician's opportunity for modifying is greatly increased. By utilizing the patient's desire for security through obedience he may employ modifying measures that will induce in the patient true processes of emotional learning. Many of the therapeutic results thus achieved may survive even if later the patient loses his hypnoid faith in the physician. However, the patient will then have to find another ersatzparent.

We have no descriptive name for this type of treatment; the term "brief psychotherapy" has some currency.

PSYCHOANALYTIC THERAPY: I. THE CLASSICAL TECHNIQUE

Freud's conception of psychoanalytic treatment

Freud's discovery of free association—thinking out loud—was a fruit of the bold initiative of Breuer's patient. With the introduction of this new investigative method it has become a psychodynamic principle that the patient shall have *his* say in his treatment. Safeguarded by the Hippocratic oath of the physician and prompted by his own need for help, he may be more candid with the physician than he ever dared to be with himself. The new investigative method disclosed the patient's life history in intimate detail and enabled Freud to organize this hitherto inaccessible material in terms of motivation and development. This type of work, he said, may relieve the patient from the necessity of sustaining inner resistances; he may recall his forgotten past, his repressed desires, and handle them in the superior manner of conscious control. Since conscious desires can produce no vicarious activity (viewed at the time as the general mechanism of symptom formation) "the continuance and even the renewal of the morbid condition is impossible" (3). As this statement shows, Freud attributed almost unlimited therapeutic power to the undoing of the patient's repressions, hence his vision of psychoanalysis as a therapy of total reconstruction that would lift the patient to a higher level of psychodynamic organization.

Freud's threefold formulation of the mode of action of psychoanalytic therapy is basic to the classical technique. He advanced it in 1904, repeating it unchanged throughout his life (3–6):

> The aim of our efforts may be expressed in various formulas—making conscious the unconscious, removing the repressions, filling in the gaps in memory; they all amount to the same thing.
>
> We do nothing for our patients but enable this one mental change to take place in them; the extent to which it is achieved is the extent of the benefit we do them (5, p. 377).

Freud's discovery and interpretation of parentifying treatment behavior

To explain the unexpected fact that the patient turns child-like in his treatment behavior, Freud introduced a hypothesis of far-reaching consequences. The patient, he said, is subject to an inner force that compels him to *transfer* his infantile responses from his past relationship to his parents to his present relationship to the physician. He thus viewed parentifying treatment behavior as a forced repetition of the patient's past, and called it *transference*. This hypothesis made parentifying treatment behavior a phenomenon independent from and unmotivated by the patient's present situation in treatment and life.

This hypothesis enabled Freud to consider parentifying treatment behavior as but another form in which the patient reproduces his past. Recollections and repetitions complement one another, each revealing the patient's past in its own way. Freud's classification of transference and the meaning of his terms are shown in table 5.

TABLE 5

"Transference": terms and meaning

TERMS *Forms of transference:*	MEANING *Patient behaves the way he did when he was:*
Positive transference	An obedient child
Resistant transference	A disobedient child
1) Negative transference	1) A defiant child
2) Sensual transference	2) A child bent on sexual gratification

Priming

In Freud's view, positive transference is the force—the only force—that enables the patient to absorb and act upon the interpretations proposed to him by the physician:

> The outcome in this struggle [between repression and therapeutic undoing of repression] is not decided by his [the patient's] intellectual insight—it is neither strong enough nor free enough to accomplish such a thing—but solely by his relationship to the physician. In so far as his transference bears the positive sign, it clothes the physician with authority, transforms itself into faith in his findings and in his views. Without this kind of transference or with a negative one, the physician and his arguments would never even be listened to. Faith repeats the history of its own origin; it is a derivative of love and at first it needed no arguments. Not until later does it admit them so far as to take them into critical consideration if they have been offered by someone who is loved. Without this support arguments have no weight with the patient, never do have any with most people in life (5, p. 387).

This passage is the basis of Freud's three rules for the handling of transference: 1) Positive transference must be preserved intact throughout the

treatment. 2) Resistant transference must be dissolved and the patient restored to positive transference. This can be done, he said, by showing the patient that it is a now senseless repetition of his infantile behavior towards his parents. 3) At the conclusion of the treatment positive transference "must be dissolved"; Freud did not say how this could be done.

Freud's rules, translated into the language of our conceptual scheme, might read as follows: Only in a state of child-like dependence upon the physician, a state of uncritical obedience, can the patient absorb and act upon the interpretations proposed to him by the physician. Therefore his child-like dependence, his uncritical obedience, must be preserved intact throughout the treatment. His disobedience—defiance—must be broken: he must be shown that it is a repetition of his infantile behavior, now disturbingly injected into his relationship to the physician. At the conclusion of the treatment he must be induced to terminate his uncritical obedience.

To sum up: the classical technique primes the patient for uncritical cooperation with the physician. The classical technique is a technique of child-like emotional dependence; it works at the parentifying level of treatment behavior.

Modifying

An adequate plan for modifying the patient's life performance must first consider the relation of available means to desired ends. It must include an itemized list of the problems; an itemized list of the tools; a set of instructions as to how to put the latter to work.

The classical plan for modifying includes no itemized list of the problems; it merely implies that the problem is to cure the patient of his psychoneurosis. This limits the plan to an outline of the relationship of the tools to one another.

The modifying measures used by the classical technique fall into three groups:

1. Interpretation of the patient's recollections for the purpose of undoing his repressions; reinforcement of the emerging insights by repeated "working-through" of the material.

2. Interpretation, for the same purpose, of the patient's resistant transference, particularly his negative transference. Translated into the language of our conceptual scheme: the physician must trace selected phases of the patient's parentifying treatment behavior to comparable phases of his childhood behavior; in particular, he must trace the patient's present defiance to his defiance of his parents in early life. The objective is to familiarize the patient with his repertoire of defiance and incestuous desires; awareness will enable him to control these infantile impulses in his life performance.

Since interpretation of the patient's resistant transference is also used to regulate his treatment behavior, it is a double duty measure in the sense of our conceptual scheme.

3. Measures of so-called "activity" on the part of the physician, such as pledging the patient to abstain from making crucial decisions while under treatment, persuading him to make an effort to fight his phobic avoidances, setting a deadline for the treatment.

In the classical technique, interpretation is based on classical psychodynamics. The emphasis is on making the patient understand his development, that is his libidinal development, his temptations, fears and mechanisms of defense. In classical psychodynamics, neurotic and psychotic behavior are described and explained in terms of libidinal development; so is, for that matter, all behavior. In the classical technique excessive preoccupation with questions of libidinal meaning and development has completely dwarfed the basic question of all psychotherapy: the ascertaining of the adaptive value (positive or negative) of the patient's life performance. The disclosure of motivation and development is notoriously mistaken for an evaluation of performance. Let me make this clear with an example. A piece of writing may be a work of art or the senseless effusion of a deranged mind; which it is can be ascertained only by critical evaluation in the cultural context, not by disclosure of its author's motivation and development.

Critical evaluation of the classical technique

The aim of psychoanalytic therapy is to increase the patient's capacity for enjoyment and active achievement in life by lifting him to a higher level of psychodynamic organization. The pre-analytic methods of psychotherapy could not even conceive the possibility of such total reconstruction. To have evolved this objective is a lasting achievement of the classical technique. How far has it advanced towards the attainment of its goal? Measuring it by its own yardstick, this is what we find:

1. The classical technique works at the parentifying level of treatment behavior. To the extent of his uncritical obedience to the physician the patient continues practicing child-like emotional dependence throughout his treatment. Therefore, this technique cannot lift him to a higher level of psychodynamic organization. By offering the patient a singular opportunity for emotional learning over a lengthy period of time, it may achieve unmatched therapeutic results; but it cannot significantly reduce his proneness to inappropriate emotional dependence. If the burden of his adaptive task increases he will seek shelter with an ersatzparent.

2. Parentifying treatment behavior is a product of the patient's therapeutic situation. The transference theory views it as a product of repetition-

compulsion (4), a hypothetical force exempt from the hedonic self-regulation of the organism, operating "beyond the pleasure principle". Thus parentifying treatment behavior appears on the scene like a *deus ex machina*. Attributing parentifying treatment behavior to the intervention of an almost supernatural force has rendered its true understanding impossible. Ultimately, it threatens to strip psychoanalytic therapy of its unique scientific and practical value, and to turn it into a ritual.

3. Analysis of the patient's parentifying treatment behavior in terms of negative transference, variously featured in psychoanalytic literature as erlebnistherapie, neocatharsis (2), corrective experience, and the like, is an inadequate procedure for the all-important therapeutic release of the patient's resentments. In Breuer's catharsis the released rage retains its true object; therein lies the therapeutic efficacy of Breuer's procedure. In the transference procedure whenever the patient vents his rage on the physician, there follows a penetrating search for the infantile origins of his rage resulting as a rule in the finding that he has again repeated his rage against his father. This procedure relieves neither the patient's true resentment of the physician nor his true resentment of his father; still less does it relieve the resentments of his current life situation which are in no small measure responsible for his present suffering. In therapeutic efficacy the scapegoat principle of negative transference lags far behind the true-release principle embodied in Breuer's procedure.

4. A one-sided developmental frame of reference of whatever kind is inadequate for the purposes of psychodynamic understanding and therapeutic interpretation. It tends to concentrate all interest and effort on the patient's past, to the neglect of his present. This fact is reflected in psychoanalytic literature, which refers neatly to the entirety of the patient's present life as his "current conflict".

5. The modifying power of the undoing of repressions is overrated. To overcome repressions and thus be able to recall the past is one thing; to learn from it and be able to act on the new knowledge, another. It is the patient's undue inhibitions that make him unable to act and learn by acting. These undue inhibitions develop in childhood and are carried over into adult life as automatizations. Undoing the repression of thought and desire does not by itself remove the automatized inhibition of executive action.

However, such shortcomings of the classical technique are not final. Psychoanalytic therapy surges with values and therapeutic resources; in its development, the classical technique is not the end but the beginning.

PSYCHOANALYTIC THERAPY: 2. THE ADAPTATIONAL TECHNIQUE

Patients lastingly incapable of adult co-operation are not eligible for a therapy of total reconstruction. They require other treatment methods.

The adaptational technique is designed to work at the self-reliant or preferably the aspiring level of treatment behavior.

In the adaptational psychodynamics of behavior disorders we encounter organized sequences of events which we have come to recognize as processes of miscarried prevention and miscarried repair (8, 13–16). They are brought into play in early life by the child's faulty emergency responses, his overreaction to danger, particularly to the parental threat of punishment. The early phase of behavior disorder, emergency dyscontrol, appears in the child's dependency relationship to his parents; its products are carried over into adult life. The ensemble of the patient's faulty emergency responses includes excessive or inappropriate fears, rages, guilty fears and guilty rages; most damaging are the undue inhibitions which have arrested function, growth and development in the affected areas, pre-eminently in group membership and sexual behavior. In the treatment of behavior disorders, the critical task is to bring the patient's emergency emotions under control; to remove his damaging inhibitions; to generate in him an emotional matrix dominated by welfare emotions (pleasurable desire, joy, love and pride) and controlled by adaptive insight, a matrix conducive to a healthy life performance. In the adaptational technique the plans for priming and modifying seek to fulfill this task.

Priming

The adaptational plan for priming is to hold the patient as much as possible at the adult levels of co-operation with the physician. When his treatment behavior turns or threatens to turn child-like, we seek to bring him back to the adult level without delay.

Child-like co-operation, that is, parentifying treatment behavior, must be understood in the context of the here and now. Adaptational psychodynamics views the patient's search for an ersatzparent as a process of miscarried repair, a cardinal feature of behavior disorders. Before he entered treatment, he moved in disillusion from one ersatzparent to the next. During treatment, as soon as he loses his self-confidence, he parentifies the physician. Resorting to the adaptive pattern, the goals and tactics, of a child, he then plies the parentified physician with smiles, tears and lashings, as shown schematically in table 6.

We know the patient's personal program for parentifying behavior from his life history; he performed this program time and again in his relationship to his parents and ersatzparents. The adaptational technique seeks to forestall the unnecessary repetition of this program in the patient's treatment behavior by the priming measure of *interceptive interpretation*. This is an intricate procedure; to succeed, the physician must first bolster up the patient's self-confidence on *realistic grounds*. Interpretation is a double duty measure: it is used for modifying the patient's life performance as

well as regulating his treatment behavior. We shall deal with it under the next heading.

Modifying

The adaptational technique's plan for modifying is too elaborate to be presented here in detail. I shall touch only upon a few major points.

We interpret to the patient his treatment behavior and life performance in an adaptational framework of meaning. By adaptations we mean improvements in the organism's pattern of interaction with its environment; these are composed of changes undergone by the organism itself ("autoplastic" adaptations) and changes brought about by the organism in the environment ("alloplastic" adaptations).

TABLE 6

Plying the parentified physician with smiles, tears, and lashings

Ingratiating: "I am courting your favor, doing everything you wish, be nice to me."
Impatient: "It's time for you to cure me (by magic)."
Seductive: "Meanwhile, make love to me (the magic of your love will cure me)."

Upon feeling rejected by the physician:
Expiatory: "Your aloofness fills me with guilty fear. I should like to expiate for my disobedience and promise to be obedient—please forgive me."
Resentful: "When I was a child my parents never let me have my way. You said yourself that's how they started my intimidation and illness. It's *your* job to undo the wrong they did me. True, you urge me 'to get it off my chest,' but you hold me in your clutches just the same. You can't fool me."
Coercive: "Now I am really furious. Stop this double talk and cure me."
Vindictive: "I shall get even with you . . . I never wish to see you again."

The patient must learn to view life, himself, and others in terms of opportunities and responsibilities, successes and failures. He must learn to understand his doings in terms of motivation and control, to evaluate his doings in terms of the cultural context, and to understand his development in terms of his background and life history.

The meaning of non-reporting (unconscious) motivation can be stated only in extrapolated terms of conscious motivation (11, 15); the strength of non-reporting motivation can be determined only in relation to the strength of conscious motivation. Therefore interpretation must always embrace the conscious as well as the non-reporting phases of motivation. Even when the biographical material on hand reaches far into the past, interpretation must always begin and end with the patient's present life performance, his present adaptive task. The significance of this rule cannot be overstated.

A mathematical interpretation may be a purely intellectual process. A

therapeutic interpretation must engender in the patient an emotional process or else miss its purpose. Freud described psychoanalytic therapy as a process of re-education; I should like to stress that it is pre-eminently a process of *emotional* re-education. In behavior disorders emotions control reason; a crucial goal of treatment is to adjust emotion to reason. Insight alone has little if any therapeutic effect. This is pre-eminently true of painful insight which is at the mercy of the patient's next emotional upheaval. Using the material of his own life experience, we show the patient how brute emotions, emotional thought, and unemotional thought differ from one another in integrative action (13, 14). He can learn to change his faulty pattern of emotional responses in one way only: by practice; he must begin to do this before the eyes of the physician. Thus, the process of emotional re-education always begins with the therapeutic release of the resentments of his current life situation. Rage glues the patient's attention to the past, to the damage he believes to have suffered; he must learn to look to the future, learn from the damage and seek repair if and when possible. If the patient arrives in the physician's office in a state of acute emotional distress, the first order of business is of course to relieve his distress.

Let me show with one example how emotional re-education works. Suppose the patient is in a state of apprehension, unable to tackle an inescapable task. Asked to give free rein to his thought, he piles up his memories of failure at comparable tasks. Emotional thought tends of course to justify and thus to feed the emotion from which it springs and by which it is controlled. We can indeed see that his apprehension grows. Suppose further that by a stroke of good luck he not only arrives at the historical origin of this particular apprehension but also discovers its connection with a latent fear of damage to his sexual anatomy. In whatever frame of reference the physician interprets this material, with whatever skill, the patient will leave the office more disheartened than he was when he came. I have seen this often enough in my patients and in patients of other analysts.

There is a silver lining in every cloud. Memories can be looked at from many angles. More often than we think, even memories of true failure, not to speak of memories of presumed failure, do contain elements of success. The therapeutic task is to neutralize the perturbing power of memories of failure by playing up the elements conducive to pleasure (10). If this is done on a sufficiently large scale the patient advances from unwarranted despair to warranted hope. We need not fear that we will becloud his judgment and teach him how to deceive himself. On the contrary, it is only when this emotional neutralization succeeds and his fears and rages subside that he becomes capable of clear thought and realistic judgment. This procedure, the *emotional redefinition of memories*, is a powerful aid in the

task of transforming the patient's emotional outlook or, as we may put it, his field of emotional expectation, and restoring his lost self-confidence. These changes are a prerequisite of all further emotional learning.

One need not fear that treatment at the adult level of co-operation deprives the patient of the requisite emotional incentive. At first the child learns only if he loves those who teach him. Later he discovers the intellectual and practical value of the subject matter to which he is exposed. He then develops the proper emotional incentives for learning by taking pleasure and pride in his growing knowledge and skills. If the patient missed out on this development he must acquire the proper emotional mechanism of learning in his treatment.

A unique instrument of emotional re-education is the therapeutic analysis of the patient's dreams; the proved value of dream analysis is considerably increased by a revised procedure. Other innovations are the preventive handling of the patient's riddance impulses (8, 13), known in the psychoanalytic literature as "acting out"; the reversal of the vicious circles of disorder into benign ones, and the dissolution of still accessible inhibitions. Here I can do no more than mention these subjects. The same applies to the development of special procedures for the treatment of the patterns of self-damaging defiance and sexual pain-dependence, other common sexual disorders, and the obsessive and depressive patterns (16).

Concluding remarks on the adaptational technique

Viewed in its entirety, treatment with the adaptational technique takes place in a different intellectual and emotional climate. As elsewhere in medicine, this change can be ascertained only through the physician's own practical experience. This of course requires thorough familiarity with all the details and finesses of the adaptational technique.

Scientific psychotherapy has undergone a process of gradual liberalization that has lifted the patient in status from subject to citizen. Breuer's patient must be recognized as the pioneer of this development. It was her good fortune and the good fortune of psychotherapy that she sought help from a physician of the scientific stature of Joseph Breuer. Breuer replaced the ancient prohibitive technique of hypnotherapy with his permissive technique. There followed the emancipation of psychotherapy from the hypnotic state, and its advance to the various forms of suggestive therapy. Freud's catharsis in the waking state led to his discovery of free association and of the patient's biography as a proper subject of medical study. This marked the beginning of a new epoch of psychotherapy based on psychodynamic principles. Freud's discovery of parentifying treatment behavior opened up the patient's emotional relationship to the physician and posed it as a crucial problem of all psychotherapy. However, under the metaphysi-

cal guise of a repetition-compulsion, the classical technique relapsed: it re-introduced the authoritarian principle in the treatment of the patient. The adaptational technique is an attempt to restore the line of development initiated by Breuer's patient.

THE TASK AHEAD

Digging in the patient's past yields diminishing returns. This fact poses a host of unexplored problems. Our technical skill in dealing with emotions is still in its infancy. Emotional resonance, known in everyday life as the contagiousness of emotions, is a significant mechanism in the therapeutic interaction of patient and physician; it awaits experimental investigation. Work on the patient's completely automatized inhibitions has hardly begun; as yet we have only glimpsed the mechanism of reinforcement.

The adaptational technique pursues the Freudian goal of total reconstruction. However, adaptational psychodynamics and some of the new principles of the adaptational technique can be used to develop a variety of other treatment procedures that would attain lesser goals in much shorter time. The social need for what I call trouble-shooting and easing methods of treatment is pressing.

Though therapy is obviously a process of interaction of patient and physician, the psychodynamics of the physician is still a rather neglected chapter of inquiry. We have viewed the patient's designs for co-operation in terms of a four-level scheme; we shall have to view the therapeutic intentions of the physician in terms of a corresponding scheme. We shall have to explore how the physician's own emotional matrix influences his choice of method, and how the fluctuations in his own emotional state influence his conduct of the treatment.

We may look forward with confidence to the future development of psychoanalytic therapy.

REFERENCES

1. Breuer, J. and S. Freud: Studies in hysteria. New York, Nervous and Mental Disease Publishing Company, 1936. Published in German, 1895.
2. Ferenczi, S.: The principle of relaxation and neocatharsis. Int. J. Psychoanal., *11:* 428, 1930.
3. Freud, S.: Freud's psychoanalytic method. In Collected papers, *1:* 264, London, 1925. Published in German, 1904.
4. Freud, S.: Papers on technique. In Collected papers, *2:* 285, London, 1924. Published in German, 1910–1919.
5. Freud, S.: "Transference" and "the analytic therapy." In A general introduction to psychoanalysis, New York, 1935. Published in German, 1917.
6. Freud, S.: Analysis terminable and interminable. In Collected papers, *5:* 316, London, 1950. Published in German, 1937.

7. Rado, S.: The economic principle in psychoanalytic technique. Int. J. Psychoanal., *6:* 35, 1925.
8. Rado, S.: Developments in the psychoanalytic conception and treatment of the neuroses. Psychoanalyt. Quart., *8:* 427, 1939.
9. Rado, S.: The relationship of patient to therapist. Am. J. Orthopyschiat., *12:* 542, 1942.
10. Rado, S.: Pathodynamics and treatment of traumatic war neurosis (traumatophobia). Psychosom. Med., *4:* 362, 1942.
11. Rado, S.: Mind, unconscious mind and brain. Psychosom. Med., *11:* 165, 1949.
12. Rado, S.: Between reason and magic. 105th annual meeting of the Am. Psychia. Ass., Montreal, Quebec, 1949.
13. Rado, S.: Emergency behavior; with an introduction to the dynamics of conscience. In Anxiety (Eds. Hoch and Zubin), New York, Grune and Stratton, 1950.
14. Rado, S.: On the psychoanalytic exploration of fear and other emotions. Transact. N. Y. Acad. Sc. II, *14:* 280.
15. Rado, S.: Hedonic control, action-self and the depressive spell. In press.
16. Rado, S.: Behavior disorders: their dynamics and classification. To be published.

CHAPTER VI

SOCIAL FACTORS IN THERAPY

A Brief Review

JURGEN RUESCH

The task of medicine is to prevent disease and to treat the sick. To pursue this aim a large body of scientific personnel collects pertinent information which eventually reaches the practicing physician. But the application of scientific information to individual cases is not easy. The analytic procedure of science, and especially medicine, relies upon the study of a large number of cases, then tends to isolate one aspect of complex events and thereafter to state averages, deviations, or probabilities. In working with an individual patient, however, the doctor deals with a multitude of aspects which are all concentrated in one and the same person. And science has not as yet developed simple procedures or machines which would obviate the human synthesis of information. The doctor's diagnostic and therapeutic activities thus remain a function of personally acquired skills. Therefore when we talk or write about therapy we cannot treat the subject matter as if we dealt with inert matter or with population statistics; instead we have to consider a number of unique circumstances which bear upon the interaction of individual doctors with individual patients.

Human relations can be considered from various viewpoints. Depending upon an observer's particular attitude, bias, and interest, he can look at therapy with the eyes of a doctor, a nurse, a patient, a sociologist, an anthropologist, a newspaperman, and so forth. Though a report on human relations is more complete if data have been collected from a variety of viewpoints, such an exhaustive treatment is rarely practical. The observer's report, therefore, will remain selective. Moreover, his approach to human relations will also depend upon the magnification used in focusing upon people and upon the number of people involved in these observations. One scientist, the physiologist, may be interested in the functions of single organs or organ systems; another, the psychologist, may prefer to study the individual as an isolated entity; the psychiatrist may prefer to focus on small groups and interpersonal relations; and the sociologist or the anthropologist may consider people only as masses of anonymous individuals.

For these reasons the study of human relations is much more than other sciences a function of the human observer. These dialectical difficulties involved in social studies are duly considered when, in subsequent paragraphs, we shall take up in succession the various schemes under which social factors in therapy have been conceptualized.

SOCIAL CONSIDERATIONS IN PSYCHIATRIC THINKING

Individual and environment

In the second half of the nineteenth century and in the beginning of the twentieth, social events in psychiatry were conveniently understood by discriminating between the individual and his surroundings. This conceptual scheme gave birth to a number of theories which blamed the environment and the poor hygienic conditions for maladjustment and mental disease. The individual-environment dichotomy enabled the early psychiatrists to concentrate on phenomena observed in individuals and to neglect the exchange with the surroundings. This particular trend, with its emphasis on genetics, constitution, studies in sex and age differences, the investigations of the effects of brain lesions and of other physical handicaps upon the mind, flourished up to the time of the first World War and the early nineteen-twenties.

In the nineteenth century the mentally sick patient was considered something that had to be disposed of or isolated; twentieth century emphasis upon the individual gradually changed the psychiatrist's attitude towards patients. The patient became a person. It is obvious that the jump from the impersonal to the more unique consideration of the individual did not come about all of a sudden; as a matter of fact, all of medicine underwent similar changes in attitudes towards health (160). In the field of public health, for example, the individual-environment dichotomy produced first a thorough study of housing, ventilation, schooling, sanitation, and a number of other factors in the environment. Empirical environmental sanitation in the second half of the last century was followed by a period of scientific control of communicable disease at the beginning of this century. From this step emerged the modern period of public health with effort directed toward the education of the individual. Education as a means to fight disease is a trend which started at the beginning of this century with the anti-tuberculosis movement, the campaign for control of infant mortality, and the creation of child health agencies. Social and individual emphasis on public health necessitated an entirely new machinery. Bulletins, health news services, movies and exhibitions as a means of spreading knowledge to the individual had to be added. The social but impersonal approach was supplemented by the efforts of the public health nurse who established personal

contact between the agency and the individual, always with the endeavor to educate the individual in the practice of personal hygiene (169).

In psychiatry an almost identical development took place. The period characterized by the isolation of the sick person in mental hospitals and the remedy of unbearable social conditions through charitable organizations was followed by a period in which social events were considered as contributory factors in the complex picture of mental disease. Investigators began to study the patients, their families, and ultimately the communities in which the patients lived. And this progressive change from the study of masses of unidentified people to the study of fewer but identified persons necessitated the breaking up of the concept of environment into smaller sub-headings; it ultimately led to the abandonment of the individual-environment dichotomy altogether.

The advances made by psychology and psychiatry at the beginning of the twentieth century were no doubt the result of a scientific attitude (7, 115, 116) which considered the individual as a self-contained social entity. Psychologists and psychiatrists of that period selected for scientific study the more consistent, overt, and repetitive features of the personality, while the more unique and rarely occurring factors as well as those which were not readily visible were minimized. The drawback of such an enumerative approach to behavior is seen in its specific distortions: the investigators omitted to cite data about themselves, ignoring the fact that their conclusions were the result of interaction. Their descriptions of personalities frequently contained so many projections that these psychological types reflected the bias of the observers as much as the events which were observed.

Freud was the first to study the more unique features of the personality and to bridge the gap between individual and environment and between individual and individual. Though he still considered the life processes of man to be a reaction of a biological entity to the environment (23), in his concept of transference he laid the foundations for the modern theories of interaction. Since World War I, and influenced by psychoanalytic concepts, there developed a branch of psychiatry which more and more considered the individual not as a self-contained entity but as a unit which is but a part of a network of human relations. A summary of these modern trends and a discussion of the convergent paths of medicine (49), sociology (21), cultural anthropology (68, 85), social psychology (117, 130), ecology (37), economics (18), and psychiatry have been presented in detail by Alexander (6), Dunham (32), Kluckhohn (84), and Ruesch and Bateson (143).

Therapy seen as a function of the individual patient

There are physicians who believe that each case is unique and that accordingly the therapeutic techniques have to be adapted to suit the indi-

vidual circumstances. It is obvious that such an attitude does not lend itself to scientific treatment, and accounts about such procedures fall into the realm of the novelist, the biographer, the raconteur, and the case reporter. Though it must be granted that occasionally great success has been achieved by adopting such individualistic procedures, nobody is able to tell whether a specific therapeutic intervention or a concomitant set of life experiences was responsible for the change.

In this patient-centered type of approach the doctor represents, if not the environment itself, at least the connecting link with the environment. In some instances the physician may become an extension of the patient, especially in the case of very wealthy patients, of exceptionally gifted individuals (91, 100), and of all those who, by virtue of birthright, economic status, or personal achievement, command the center of attention.

For the prominent and wealthy, the doctor is frequently nothing but a skilled servant; and in return, there are certain socially mobile and ambitious doctors who use, consciously or unconsciously, wealthy patients for improving their social status and making further contacts. Thus both parties utilize each other for their secret purposes, the human relations remain unchanged, and therapy becomes a failure. Status here sanctifies neurotic social relations.

If patients are members of the lower social classes, treatment is rarely considered a function of the individual patient. Instead, therapy is then viewed as a procedure which has to help the majority of such people and the treatment tends to become more administrative and also more impersonal. What is gained in objectivity is lost in a lessened human interest.

Therapy seen as a function of the individual doctor

Some people pride themselves on finding a famous doctor who will cure them. They run to quacks, to crackpots, and even to qualified physicians who tend to make out of their practice a cult (157). The patients who themselves contribute towards the glory of the physician and who find their existence worth while because they are a small feather in the cap of a famous man fit into the neurotic social relations of the physician. They become extensions of the physician and live in symbiosis with him. It must be granted that many very sick individuals are thus kept above water; for them, to remain dependent upon an authoritarian personality means to continue their neurotic compensation indefinitely.

Again this is the privilege of the wealthy. The poor cannot afford to cling to a doctor, and the doctor cannot afford to spend his time without earning a living. In clinics, then, the personal dependency is supplanted by procedures which make the patient dependent upon a drug, on physical therapy, or perhaps on periodic re-examinations. The dependency upon a person is

replaced by a dependency upon an institution, a medical gadget, or a treatment method.

Therapy seen as a function of patient-groups

The most commonly accepted diagnostic procedure in the field of medicine and psychiatry consists of classifying patients into groups according to personality features, symptoms, syndromes, and many other criteria. Therapeutic procedures then are formulated not so much in terms of the individual needs of a single patient but in terms of the benefits expected for the group as a whole. While such a procedure does not insure the maximum benefit for the individual patient, each patient has at least a reasonable chance of improvement if well-formulated therapeutic procedures are applied. In this type of scientific approach, consideration of individual human relations is impossible. An individual human being becomes a case in a series of cases when he is subjected to standardized procedures, and the physician then tends to disregard the patient's individualized needs. The medical scientist's tendency to reify nosologies probably invalidates many of his scientific statements, especially with regard to conclusions bearing upon the effects of drugs, surgical procedures, and other means of physical treatment. In such situations, the influence of the person who applied the treatment may have been greater than the effect of the drug or the surgical method itself; but the scientist's disregard of the human element makes an appraisal of the situation impossible.

The scientific fallacy of categorical thinking is obvious: what is not in the scientist's classification system for him does not exist. Fortunately in recent years even the most die-hard scientists have come to the point of acknowledging the interpersonal elements in the study of medicine and biology.

Information pertaining to the personality structure of one person frequently does not permit prediction regarding the nature of interpersonal relations with another as yet unknown person. However, study of human relations within the framework of a group eliminates somewhat this element of uncertainty. Information about a group consists essentially of knowledge pertaining to the type of interaction which can be expected. Though again individual variations get lost in the pool of averages, such a procedure nonetheless enables the scientific investigator to derive certain generalizations, for example, about social status, social mobility in relation to illness (137). Patients suffering from a variety of chronic diseases (135), thyroidectomized patients (134), and patients afflicted with duodenal ulcer (132) were studied by Ruesch and associates. In these investigations, social class membership was determined by a simple rating scheme in which people's behavior was classified in terms of the way they spent money, the houses they lived in, the property they possessed (economic status); in terms of the prevailing

family structure, the occupation held, and the associations adhered to (social status); and finally in terms of their education, their attitudes and value systems (ideological status). These criteria were derived from Warner's work (168) on social classes in America.

Middle-class persons, with their tendency to conform and to minimize emotional expression, have a predilection for tension syndromes involving the gastro-intestinal and the vascular systems. Lower class people, in turn, are more likely to be afflicted by accidents as a result of violence, exposure to machines and danger, and by all those diseases which are the result of poor environmental hygiene. The lower the income, the higher the incidence of serious mental disease (105); the schizothymic personality occurs more often in the lower classes, and the cyclothymic personality in the upper classes (165). Commitment rates by occupational groups seem to be negatively correlated with occupational income and prestige (18).

People who attempt to move from one social class to another in order to improve their social position are more liable to contract tension disorders than are those who are satisfied with their social position (137). The social climbers and strainers who in their childhood learned the social techniques characteristic of their own group have to learn anew and at a later age all the social approaches (139) prevalent in the new group. If, for example, a family has been middle-class for three generations, the economic status is usually appropriately matched to the social and ideological status. If, however, a person has only recently come into money, the ideological status and family structure from earlier years may have been retained. The new group does not necessarily accept the newcomer socially as an equal, and the old group is likely to be envious of his success. This rejection by two groups may lead to social isolation. Change in social class membership thus was shown to be a source of stress and strain contributing towards ill health (135).

In America, culture change is a major source of stress and strain, since more than fifty per cent of the population are estimated to be involved in constant processes of acculturation (133). The figures, broken down, read as follows: According to the 1940 census, 8.8 per cent of the population of the United States were foreign-born whites, 17.5 per cent were native-born whites of foreign or mixed parentage, and 10.2 per cent were non-white people comprising primarily Negroes, and to a lesser degree Chinese, Japanese, Indians, and members of other races. It is safe to assume that many of these people have problems in acculturation — the foreign-born in adjusting to the American culture; the native-born with foreign or mixed parentage because of their dual value system; and the non-white people because they are a minority group. It is estimated that more than thirty per cent of

the United States population are involved in change of social status; an additional twelve per cent are migrants, either within the confines of the state or from contiguous or non-contiguous states into other states. That migrants have more personality disorders than non-migrants and that among the migrants the intracity migrant is the least stable and the most disturbed were shown by Tietze, Lemkau, and Cooper (166).

Immigrants and colored minorities in the United States tend to strive towards an imaginary American core culture most clearly represented by Anglo-Saxon, middle-class Protestants. Comparison of morbidity and mortality of the immigrant population with that of the native population (20, 28, 29, 30, 105, 126, 170) furnishes an index of the stress encountered in this process of cultural striving. Studies show that foreign-born persons tend more than the native population to live within the family circle and to renounce outside contacts. They are usually married, have many children, and are law abiding citizens. But they, more than the natives, are susceptible to physical and mental disease—in part perhaps because of the stress and strain of culture change. The native-borns of foreign or mixed parentage are, in their childhood, particularly exposed to conflicting value systems; the opinions of the parents frequently clash with those of the surroundings, and the subsequent conflict is undoubtedly related to the higher rate of delinquency, crime, and susceptibility to physical and mental disease found in this group.

The non-white man belongs to a caste (104); conflicting value systems and poor economic conditions make for rebellion and crime, and the strain of being a member of a subjugated group, as well as poor hygienic conditions, is probably associated with the higher incidence of and mortality in tuberculosis and venereal disease and the greater infant mortality among the non-white minorities.

Studies of displaced persons in Europe (106) and immigrants to Canada (167) indicate that culture change may produce tension and anxiety and may result in a large number of somatic complaints. In an apparent contradiction to these findings, a European source (86, 106) reports that the severe hardships encountered in concentration camps combined with the rigid enforcement of rules occasionally ameliorated psychoneuroses and psychosomatic disturbances. In spite of these contradictions, the conclusions to be drawn from these studies seem to demonstrate that either the extreme restriction of choice or the abundance of multiple choice situations contains the anxiety producing element. People can tolerate change when it occurs at the right age and at an optimal rate. Apparently both the persons with a tendency to "overadjust" and those who are inclined to "underadjust" tend to break down. Culture change, when it is too small, as in

Europe, or when it is impossible, as in a prison or a concentration camp, or when it is too fast, as in the case of some immigrants to the United States or Canada, may become the source of tension syndromes and maladjustment (133, 137).

People suffering from maladjustment, displaced persons, and people in the process of culture change—or, in brief, many marginal people (118) tend to settle in cities. Studies dealing with the ecology of mental disease (32, 36, 37, 53, 64, 111, 122, 149) indicate that mental disorders in cities show a wide range of rates with high rates concentrated at the center, declining in all directions towards the periphery. Good housing, of course, is found at the periphery of modern cities, and the mentally sick usually have to be content with the undesirable sections of town.

Maladjusted people do not live alone; they have families. Therefore, Richardson (127) suggested considering the family (14) rather than the patient as a unit of illness. Studies of the family as a unit reveal that within such a group there are positions which predispose certain members to one type of disease more than to another. Among ulcer cases (132), for example, there are about twice as many youngest children and younger-born patients than older and oldest-borns. The reverse is true of thyroid patients (134) who show a preponderance of older-born women. In the birth sequence, the number of years which separate a patient from his next older and younger siblings is of significance. If it is more than four years, children grow up in psychological isolation in spite of the fact that they possess siblings. In a sibling series in which there are, for example, three girls or three boys in succession, the arrival of a new child of a different sex produces a more marked change in the parental attitude than if the sexes are evenly distributed. The withdrawal of affection from the second youngest is probably more pronounced if the younger sibling is of a different sex than if the sibling is of the same sex. All of these observations are matters which pertain to the family as a whole, and remedial and preventive measures can be formulated only on the basis of an understanding of the individual within the framework of the group (132, 135).

Analysis of the parental constellation of patients in terms of closeness and distance with respect to father and mother and the distribution of such functions as authority, source of affection, and suitability as ideal model between the parents yields significant results. Whenever the source of affection, the source of authority, and the ideal model are concentrated in one and the same person, the normal development of the individual is handicapped; dependency and resentment are the results (132, 134). However, when the functions of authority and principal source of affection are divided between at least two people, the chances for an individual's more rapid and better maturation are considerably increased.

Therapy seen as a function of doctors

Few are the studies which center around the social characteristics of the medical profession. Hall (65) distinguishes three types of careers chosen by physicians. The first is based upon cooperation with colleagues, loyalty to hospitals, to members of the profession, and to medical institutions. The second, described as the individualistic career, is said to be undertaken for commercial and competitive reasons. The third is described as the career of a friendly person who has many human relations and who is loyal to individual persons rather than to groups. It is obvious that therapy is in part a function of the personality of the physician, and depending upon the career chosen the therapeutic approaches must vary.

Psychiatrists as a group have rarely been the focus of comment. Scattered remarks are found in discussions concerned with the personality and training of psychotherapists (10, 46, 163), and in critical analyses of therapeutic approaches and theories (69, 75). Some of the economic aspects of psychoanalytic and psychiatric practices have been treated in statistical studies by Kubie (88) and Muncie and Billings (114), and an analysis of the family doctor's relationships was described by Hoffer (74).

Ruesch has been interested in the personality of psychiatrists (143). In a heretofore unpublished investigation, the relationship between certain life experiences of psychiatrists and their subsequent careers has been analyzed. For this purpose, the author reviewed two hundred obituaries published during the last ten years in seven leading journals of psychiatry and neurology (Amer. J. Psychiat.; J. nerv. ment. Dis.; Psychoanal. Quart.; Psychoanal. Rev.; Int. J. Psycho-Anal.; Psychiatry; Arch. Neurol. Psychiat.). The data were supplemented by information derived from the Biographical Directories of the American Psychiatric Association (1941 and 1950) and the American Medical Association, as well as from Who's Who. Of the two hundred obituaries, forty-five were excluded because they dealt with foreigners who never lived in the United States, sixty-one were excluded because they were too short and did not yield pertinent information or because the deceased was not an M.D. An analysis of the remaining ninety-four obituaries is produced in table 7.

The data contained in this table corroborate the well-known fact that psychoanalysts and psychotherapists gravitate towards private practice, neurologists, neurophysiologists, neuropathologists, and neurosurgeons tend towards teaching, research, and consultant positions, and those who are interested in general or clinical psychiatry tend to seek administrative positions at the Federal, state, or community level, or in private organizations or hospitals. Furthermore, the table points out the less-known fact that persons interested in psychoanalysis and psychotherapy that is, in the psychological and social aspects of psychiatry are persons who have

undergone culture change. Unfortunately the data contained in the obituaries did not indicate changes in social status or the incidence of personally traumatic events but mentioned only the major geographical migrations, either from Europe to America or within each of the two continents. While two thirds of the psychoanalysts and psychotherapists showed gross culture change from ethnic to American, one half of the general psychiatrists showed migration from one region of the United States to another. The neurologists had the greatest stability in terms of indices of culture change.

TABLE 7

Review of obituaries of 94 psychiatrists and neurologists

	PRINCIPAL INTEREST		
	Psychoanalysis; psychotherapy	Neurology; neuropathology; neurosurgery	General psychiatry
Number of cases	15	38	41
Mean age at death	61	70	68
Principal occupation:			
Private practice	10	10	6
Teaching, research, consultant positions	5	24	6
Administration, mental hygiene, full time hospital positions	0	4	29
Nativity:			
Foreign-born	11	5	6
Native-born	4	33	35
Culture change:			
Ethnic to American	11	5	6
at mean age of	34	28	18
Migration within Europe	5	4	2
Migration within United States	6	12	19

The psychoanalysts and psychotherapists died at a younger age than the other groups. The skeptical mind will tend to point out that psychoanalysis and psychotherapy were imported by Europeans and that the culture change shown by psychoanalysts and psychotherapists was largely due to political conditions. Strangely enough, however, five of the foreign born analysts had engaged in migrations in Europe already. But no doubt this hypothesis needed further testing.

The tentative conclusions arrived at from the study of obituaries indicated a relationship between careers chosen and life experiences bearing upon the change of values. In order to check these conclusions with data

obtained from psychiatrists themselves. Ruesch and Loeb at The Langley Porter Clinic, San Francisco, studied a group of twenty-five psychiatric residents and instructors. Each individual was studied for three to five hours with regard to his or her social characteristics. Attention was paid to social class membership, social mobility, geographical migration, ethnic background, and to all those factors which might be taken as an index of culture change. The method used has been described in detail elsewhere (133, 135). The interview was directed in such a way that the doctors were likely to comment upon their careers, professional interest, and preference for future employment.

Of the twenty-five subjects, eleven claimed to have no interest in anything but psychotherapy. All of these had at least a bi-cultural experience in early childhood; some were children of recent immigrants to this country, others were born abroad and came to this country during the first few years of life, and a few others belonged to a minority culture in Europe during their early childhood.

Ten other doctors professed major interest in administration, teaching, or research. Though it is impossible to collect significant statistical data on traumatic childhood events in ten cases, the interviewers were struck by the fact that this group emphasized more than the other groups the importance of psychological trauma. Death, divorce, and forced separation of the parents, protracted illness of the parents, and invalidism and mental deficiency of a sibling seemed to have left deep grooves in the minds of these doctors. Their cultural backgrounds were either old American or Western European.

Four doctors were primarily interested in neurology and neurosurgery. Three of these were from old American families, and one was a Chinese physician recently arrived from his homeland for a temporary stay in the United States. The three subjects who derived from the American culture had a history of straightforward conflict with parents during adolescence, characterized by their inability to accept father's authority.

As one might well expect, most of the subjects were from middle-class backgrounds. In the group interested in psychotherapy, four out of eleven were social climbers who derived from the lower classes, in contrast to eight out of ten in the group interested in administration. In the group interested in neurology and neurosurgery, none was a social climber, the three Americans being solidly upper middle-class and the fourth, the Chinese, being the son of a high government official in China.

To analyze or predict vocational choice is a difficult task, and far be it from me to claim that culture change is the only factor which awakens in people psychological curiosity. The present study, however, definitely points to the fact that there are factors other than professional training and mental health which mold the personality of the future psychotherapist. Appar-

ently one group of persons who profess interest in psychology and therapy derived their orientation from exposure to different systems of values, either in the form of culture change or in the form of a change in social status. Youngsters who have to adapt to cultural differences in their formative years become somewhat conscious of the meaning of psychological differences. In addition, the experience of culture change usually masks subtle interpersonal difficulties within the family, which fact is borne out by those cases studied therapeutically over a longer period of time. Individuals who master the trauma of culture change and who have struggled with their neuroses in later years can comfortably use their experiences in helping others.

The second group, which tended towards administration, developed an interest in psychiatry probably not so much because of culture change but rather because of personal traumatizing experiences within the family. These individuals did not feel comfortable enough to help others and tended to be interested in administration, teaching, and research all activities which give them a maximum of control.

The four neurologically and pathologically oriented individuals did not show any particular interest in human beings, or at least their interest was well masked. They did not experience culture change or social mobility. They were interested in nature "as it is" and preferred to engage in work which demanded little self-awareness. Unlike other psychiatric disciplines, their vocation does not expose them to blame for failure in treatment.

Therapy seen as an interaction phenomenon

The initial observations of Freud, who under the terms "transference" (43, 107) and "counter-transference" (42) described how the relationship between doctor and patient can be utilized for the benefit of the patient, were later expanded to the wider field of interaction in a variety of social situations. We are indebted to Sullivan (113, 158, 159) for the notion that interaction has a therapeutic effect, and to Lewin (95, 108) for field theoretical concepts for the analysis of group activities.

Today the importance of the doctor-patient relationship has been generally acknowledged. This problem has been amply treated in the literature, varying from the rules about ethical standards of behavior contained in the Hippocratic Oath and from admonitions laid down by medical societies (16) to the psychoanalytic concept of rigidly controlled doctor-patient relationship (82). In the psychoanalytic situation, interaction is artificially minimized; and though it must be granted that such a procedure is indicated in certain patients, it should be obvious that for others, especially for the more infantile, the psychopathic, and the schizophrenic patients, interaction becomes an absolute necessity. Failures encountered with the psychoanalytic method in its original form, especially with severely sick

patients, induced a number of analysts to change their technique. Under the influence of Ferenczi (38, 39) and Rank (123) and later of Sullivan (158, 159), Fromm-Reichmann (47), and perhaps Rosen (131), the originally rigid analytic procedures were modified to provide for more interaction between doctor and patient; these modifications, in a hospital situation, have been extended to include the interaction of patients with other patients and the medical personnel (24, 155, 156, 161) as well. Today we know that we cannot understand the patient's human relations without encompassing the total social situation in which he finds himself. Not only the direct relationships of the patient to his fellow patients, to the visitors, and to the doctors, but also the collateral relationships of doctors and personnel among themselves can influence the patient's behavior. These observations have led the author to believe that the conditions described as neuroses and psychoses are essentially not diseases located in an individual but are disturbances which involve a whole group. A disturbance which affects the group organization may manifest itself by symptoms localized primarily in one individual.

Psychiatry thus develops along lines which parallel the events in clinical medicine. For example, modern medical men have long since abandoned the belief that tuberculosis is a disease of the lungs or diabetes a disease of the pancreas. Today they think of a diseased organism. What the human organism is to the physiologist the group is to the social scientist. More and more the individual is viewed as a part of a complicated group network and a patient as the station in which the disturbance is localized. Recent events in child psychiatry seem to support this view; treatment of mother or father may result in spectacular improvement of the sick child who may lose his symptoms without having been treated directly (162).

A biological entity such as the human being may not necessarily prove to be a useful entity for scientific study (141). The spectacular results achieved by preventive medicine and public health are due to the fact that the interaction of the individual with his surroundings was considered as an entity. In psychology similar developments took place. The work of Lewin (95) pioneered the way for an analysis of group dynamics (76, 108), while others attempted to measure or rate the interaction of individuals or groups (9, 17). In psychiatry, similar trends of thought led to the various types of group therapy (109, 110, 150, 151). We have to remember that group therapy was invented not only because psychiatrists were too busy to see patients individually but also because group situations supply a type of experience and provide for correction of certain disturbances not found in a two-person situation. It is well known that schizophrenic patients, for example, have great difficulty in functioning in a group and that they are hardly capable of maintaining simultaneously several roles (3) with several people. For example, a schizophrenic may be incapable of being simulta-

neously father, husband, and son in the presence of his assembled family, and he handles this difficulty by withdrawal (140). And just as some patients have to learn to tolerate intimate personal relations because they only know how to behave in groups, others have to learn to function in groups and to give up their dependency upon close human relations.

The awareness that interaction within a social setting is one of the most important therapeutic agents has resulted in new rehabilitation methods which have as their aim the socialization of patients (138). Curle and Trist (19) have reported on the civil resettlement of British prisoners of war and the methods used to induce social participation. Others have gone a step further by studying a whole community not only with the intent to gather information but also with the purpose of practicing social psychiatry right on the spot (97).

Therapy seen as a function of the culture

There are authors who believe that therapy is primarily shaped by cultural considerations. Let us analyze for a moment what is meant by culture. Data pertaining to a large number of people who neither as individuals nor as a group are really identifiable usually are subsumed under the heading of culture. The influences of tradition, of custom, of language, and of a host of other factors to which the individual is exposed in daily life cannot be examined individually; collective terms, therefore, are more practical for these more ephemeral mass events (152). With this construct, anthropologists, for example, are enabled to evaluate the influences of the newspapers, the movies, or the taxation system upon masses of people without having to bother about the effect of a particular movie upon a particular person. Culture thus is a concept which exists only in the heads of the scientists; it does not exist in reality. But nonetheless it fulfills a useful purpose (142).

The best way in which a person's adjustment to the culture can be described is in terms of values. Without going into details of value theory it may be sufficient to state that values represent nothing else but foci around which information is organized, and the way in which information is organized obviously determines subsequent actions. Thus one can distinguish the values held by people and by patients (68, 137, 173), the values held by doctors (50, 120, 143), the values which govern therapeutic operations (44, 52, 121), and finally the values held by society at large (35, 40). Psychotherapeutic activities are embedded in these cross-currents of our time (78).

The values held by individuals or groups of individuals usually are revealed in the stereotypes, caricatures, and distortions held about other people. Though the prejudices against minorities and the stereotypes held by the majority with regard to minorities have been the subject of extensive studies (2, 5, 101), little is known about the particular prejudices which

influence therapy. However, the stereotypes pertaining to the psychiatrist (125) and to the mental patient evidence the fact that the public believes that the medical profession is as prejudiced as any other group of people.

The most important cultural determinant of therapy is found in the concept of health, which not only is shaped by physicians but also is the result of tradition, social and economic factors, and all those notions which are designed to perpetuate the existence of a given group. What is healthy for one group of people may mean destruction to another group of people. Medical circles are somewhat reluctant to view the concept of health as culturally determined, and repeated attempts have been made to establish biological norms for what is healthy and what is unhealthy. Though it is possible to define health operationally as optimal functioning of an organism, the concept of optimal is obviously dependent upon the state of science of a particular group and therefore is again culturally determined.

The concept of mental health is even more culturally determined. In the field of psychiatry all those who have attempted to establish biological norms, for example in an attempt to determine the healthy and the unhealthy ways of raising children, have run into difficulties. The function of child-raising practices is to perpetuate a given culture; evaluation of these practices, therefore, has to be undertaken in terms of the culture in which they occur in spite of the fact that biological variables are involved (35). Apparently it is difficult if not impossible to define what are normal human relations, and though a great deal of effort has been directed to making comparative studies of human relations in various cultures, few are the generalizations which can be made that are independent of the culture in which they occur (80, 128).

Mental disorders are, in themselves, a function of the culture in which they occur (129). Any person that does not fit into accepted traditions and conventions is declared out of bounds, and the management of such persons is relegated to social institutions and specialized people who take care of marginal man (118). In our culture, the task of dealing with deviants is relegated to the psychiatric, penal, and other corrective institutions, while in more primitive cultures the same task may be entrusted to the medicine man (90, 92). And as psychotherapists we have to be aware that all our therapeutic operations are subordinate to the relativistic value of health (143) and that our attempts at rehabilitation are essentially designed to facilitate participation in the type of human relations that predominate in a particular culture.

Psychotherapy and all types of therapy thus can be viewed as being embedded in a cultural matrix (119, 143). The values which govern the physician's actions, the values which determine the patient's reactions, and the values which determine the therapeutic procedures are all culturally determined. For example, in America doctors are middle-class persons who

view the world with the distortions characteristic of middle-class people. On top of this particular view we find the distortions added through the training of doctors as physicians and psychiatrists. Ultimately then, the doctor has a composite view which is made up of his life experiences as an individual and of his collective experiences as a middle-class person and as a member of a professional group. These views obviously strongly influence his therapeutic operations as well as all his social relations, and both are consciously or unconsciously utilized in his contact with the patient. Therefore it is paramount that the psychiatrist be aware of the existence of such forces, and though he can in no way escape them he can at least abstain from considering these either as correct or as absolute. Relativism thus becomes a necessary feature in the understanding of human beings.

Relativism is brought about by culture change which teaches an individual to translate experiences from one value scale into another. Such a translation may be forced upon the child because mother is French and father is English; it may be brought about by migration from Europe to America; it may deal with the abandonment of values acquired on the wrong side of the tracks and the learning of values which pertain to the right side of the tracks. Perhaps it may deal with the conversion of values prevailing in New England into those existing in the South; it may consist of adjusting the values held by a racial or cultural minority to the values held by the majority; or it may be due to a change of values brought about by extremely traumatic experiences such as the acquisition of a chronic disease or the loss of a family member.

A similar translation of values is undertaken by the psychiatrist when he attempts to understand patients. Differences in personality or the nature of psychopathology necessitate that the psychiatrist translate the patient's values into his own terms, and these very differences when perceived by the patient have a therapeutic effect (143). In these terms it would appear as if the formal training given to therapists and analysts were nothing but a more formal organization of past life experiences. If certain life experiences are missing, no training can transmit to an individual at the late age of thirty the art of translating values and understanding people who are different.

A psychiatrist who possesses information regarding the values of individuals, groups, and cultures (41, 70, 147) will understand the changes in values which will take place when people meet. Two or more persons who in the course of communicating with each other exchange information reveal their values; and in the course of such exchange, values — that is, foci of information — become reorganized. Therapy thus can be likened to an exercise in acculturation (143), and the psychiatrist can be likened to the man who travels in foreign lands. Before the stranger can relate himself to the natives he has to explore their value systems, while the natives in

turn see in the traveler the emissary of a strange group of people. We have mentioned before that the process of culture change and acculturation imposes a great amount of stress and strain (66, 77, 133, 137). In therapy the rate of change is somewhat under the control of the physician, and excesses of strain can be avoided. Perhaps the whole beneficial effect of therapy can be thought of as consisting of a reorganization of information as a result of a clash of values with a subsequent influence upon the physiological stress mechanisms of the individual (171).

Therapy conceived of as a function of communication

In this rather brief review of social factors pertinent to therapy it becomes obvious that the various approaches cannot be reconciled unless the various schools of psychiatry and the various interested disciplines agree upon the use of a common scientific system. In collaboration with Bateson, an anthropologist, the author has outlined such a unitary system (143) in which human relations and social factors at the individual, group, and cultural levels can be expressed in terms of communication.

It is a well established fact that anything that a human being perceives, whether it be word, object, or action, will influence his conscious or unconscious body of information. Social factors then are nothing else but mandatory or enlightening messages perceived by the patient. In person to person communication, the origin and destination of messages are more or less known to the participants. In mass communication, through the means of radio, the press, and the movies, for example, messages are distributed over a network in which the identity of the receivers is unknown and remains anonymous. Social factors thus are all those conscious and unconscious perceptions by an individual which derive directly or indirectly from human beings and which influence the individual's thinking and his actions. Any individual operates in a social matrix consisting of a multitude of messages, the origin and destination of which are frequently unknown. This is the way the concept of culture is understood in terms of communication.

Therapy then has the task of tracing some of these perceived messages to their source of origin, either diachronically to events which happened in the past or synchronically to other events which happen at the present. Likewise has the therapist the task of making the patient aware that all his actions, not only his intended messages, when perceived by another person will produce an effect upon this very same person. Furthermore, the patient has to learn in therapy that while his personal communications to another person may have only a limited scope this very act of communicating is in fact an infinitesimal part of the larger superpersonal networks of groups and cultures.

Therapy in terms of communication is thus conceived as a process in which two or more people communicate with each other. This process takes

place in a wider network or social matrix composed of many messages of identified or non-identified origin. It is the aim of therapy to help the patient to acquire a suitable body of information pertaining to both intra-organismic and extra-organismic events. In order to keep information up to date, the patient must be able to perceive relevant cues, to transmit messages formulated in understandable terms, and ultimately to evaluate the effects of his messages upon others. When the patient has regained his ability to correct his information, the foundations have been laid for further growth and mental health.

SOCIAL CONSIDERATIONS IN THE PRACTICE OF THERAPY

Changes in the social reality of the patient during therapy

During therapy it may happen that a relative dies, that the patient's economic condition changes, that a severe illness such as cancer appears, that a war breaks out, that the therapist gets sick and has to abandon therapy, or that the patient is compelled to move away. Whenever such an emergency exists or is anticipated, the therapist's first task is to alleviate the burdens produced by the therapeutic situation to the extent that the patient can use all his resources for the management of the external reality. The therapist then should emotionally support the patient and should postpone all stress producing interventions until such time as the social conditions are once again stabilized. The underpinnings of a person's psychological structure cannot be tackled in times when the external reality requires undivided attention. Once the situation is stabilized, the implications of the change must be discussed if therapy is continued, inasmuch as alteration of one of the patient's outside relations usually changes his relationship with the therapist. This experience can be utilized to show the patient that his human relations are interdependent and that one change within his social setting may affect his relationship with all other members of the group, including the therapist (47).

Therapy with white immigrants

Psychiatric institutions, mental hygiene clinics, social service institutions, and other agencies get, in addition to the native-born white clientele, a number of patients who belong to ethnic groups. The problems encountered vary, but the symptoms of the patients' mental conditions usually reflect the stress of culture change. In the medical and psychiatric care of immigrants, the most frequent condition met with perhaps can best be subsumed under the heading of reactive depression; it occurs at the end of the first year or perhaps at the beginning of the second year after immigration to the United States or to England (48, 83). Apparently the hopes and illusions held about the new country fade after the end of about a

year; then the immigrants begin to see the realities involved in their migratory move. They are confronted with adaptation to a new culture, while at the same time they miss many of their old friends and relatives. The same phenomena can be observed not only in ethnics but also in natives who migrate from the East coast to the West coast; many of these people at the end of the first or beginning of the second year suffer from minor depressions. This phenomenon is apparently due to the fact that the ties with the old surroundings have been severed at a time when identification with the new surroundings has not yet been established. Persons thus are neither members of their old groups nor members of a new group. They feel unloved and isolated, and develop all the symptoms of a minor depression.

The various ethnic groups somehow differ in their particular problems (13), and casework with Italians (146), for example, is different from casework with Poles (83) or Scandinavians. While the immigrant who belongs to one of the well established national groups has the advantage of being able to live among fellow countrymen, the displaced person (124) who either went through years of imprisonment or experienced many culture changes has somehow lost this advantage. Psychotherapy with displaced persons, even though they may have some relatives *in* this country, follows along different lines than does therapy with neuroses in native-born patients. The displaced person's major task is to face the *realities* of American life (27). The social case worker is usually better equipped to deal with such cases than is the psychiatrist. He can institute an efficient program designed to overcome the difficulties in acculturation of such patients (79, 153). In several cities of the United States there are institutions (164) which take care of these particular problems of immigrants – for example, the International Institute of San Francisco, a Community Chest supported social service agency.

The planning of the rehabilitation procedure follows along various lines. First and above all, the case worker helps the individual in matters pertaining to immigration and securing citizenship and assists the immigrant in having other family members who were left abroad join him in the new country, in establishing relationships within his own ethnic group in the American community, and in becoming aware and tolerant of other ethnic groups in the American scene. Such counselling devices help the patient to settle within his own group so that he can continue with his old means of communication while he is learning the new ways of life. Secondly, the immigrant is taught to get in contact with natives and efforts are made to interpret the American culture to the newcomer. Information about the American value systems, customs, and traditions is implicitly and explicitly conveyed to the client by having him participate in language and citizenship classes and in artistically and socially oriented group activities. Finally, after having been made familiar with the basic principles and the language

of the new culture, the immigrant is helped in obtaining employment and proper housing and in learning to use the outlets which the community and the government provide for health, education, and recreation.

The adjustment difficulties of immigrants are not exclusively related to the realities of culture change. The motives which made people leave the old country usually are related to hardships of a physical or social nature or else they bear upon the immigrant's personality development. While those who leave the old country because of hardships can easily be settled in another country, persons who were unable to identify with their parents or with their own group will tend to show the same difficulties in the new country, in spite of their claims that culture change is the source of their unhappiness. In these cases, intensive psychotherapy seems to be the method of choice. However, care should be taken to choose the appropriate method at the right moment. Therapy has to support the natural tendencies of the patient to adapt. In contrast to other patients, the immigrant has no standardized means of exchange with the surroundings; his human relations are not stabilized. Accordingly, therapy has to be flexible, ranging from insight therapy to supportive measures.

Therapy with members of other races

A difficult problem is met when the white, upper middle-class psychiatrist attempts to undertake therapy with Indians, Negroes, Japanese, Chinese, or with members of any other race. He cannot circumvent the fact that he, as a white person, has been assigned a role in the mind of the patient which expresses the patient's cultural heritage and his lifelong experiences as a colored man with white people. And likewise the psychiatrist cannot help seeing in the patient a representative of a race against whom white people usually have many prejudices. It is easier to do therapy with a white member of the western civilization who does not speak the same language than to do therapy with a person who speaks English but does not really belong to the orbit of western civilization. The difficulties are essentially related to a misinterpretation of messages—especially of the non-verbal messages which are exchanged between the patient and the doctor. The cues pertaining to familiarity and distance, to status superiority and inferiority, to similarities and differences, to approval and disapproval, are not shared in common; the basic assumptions about communication are different; the social approaches vary; and in this confusion it is difficult to find a common meeting ground. Furthermore, if the white psychiatrist gets the patient to accept some of the means of communication that he uses and if he imperceptively imparts to the patient some of the western values, he often maladjusts the patient more than he helps him because ultimately the patient will live among Chinese or Japanese, Negroes, South Sea Islanders (154), or

Indians, rather than among whites, and the new values will hardly help him to adjust to his own group.

The literature of therapy or psychoanalysis of white men with members of other races is scarce. Adams (4), Bernard (11), Hillpern (72), Kardiner (81), McLean (103, 104) and St. Clair (144) were concerned with the problems of Negroes; Devereux (25) and perhaps Leighton (93) with American Indians; while Babcock (8) and Handley (67) comment upon therapy and casework with Japanese. Ruesch, in an unpublished study, recorded carefully the course of therapy with Japanese, Chinese, Negroes, and one Parsi. These eight cases do not warrant any statistical generalizations, but in conjunction with what has been said in the literature some conclusions can be made. There seems to exist uniform agreement that therapy with members of other races does not differ from therapy experienced with whites, provided that both persons possess rather complete knowledge of one and the same language and system of communication. Furthermore, it seems to me that it is easier to carry on therapy with Chinese, Japanese, and Indians who are not Americanized and who retain their old cultural endowment. Difficulties increase in therapy with Chinese, Japanese, and Negroes who want to Americanize themselves and become like white people themselves. In such situations the therapist was looked upon as a teacher as well as a judge. He was considered an arbiter of acculturation, and the course of therapy followed much along the lines of therapy with prisoners. Ultimately such patients do not fit either into the American surroundings or into their ethnic groups. Instead, they are destined to live in those heterogeneous groups which consist of displaced persons of both cultures. In these marginal groups there are many people of mixed marriages who develop transitional patterns of behavior. Their values and means of communication contain elements of several cultures, castes, and classes, and if these groups are large enough their members lead quite a pleasant existence.

Therapy with members of other social classes

To a lesser degree, the same problems are met in the therapeutic situation where physician and patient are both white but belong to different social classes. A patient who is a member of a lower status group may use the psychiatrist to learn the ways of life of upper status groups; and, conversely, a middle-class physician may use a prestige-carrying patient to enhance his own social standing. Unfortunately, however, rational psychotherapy comes to an end when doctor and patient use each other for purposes other than therapy. As a matter of fact, the present methods of individual psychotherapy—psychoanalysis included—are methods which were designed for use between people who belong to approximately the same social class and who share in common a large number of assumptions. This fact is borne out by

the experiences of all those who have attempted to proceed with middle-class psychotherapeutic or psychoanalytic methods in treatment of lower class patients. The middle-class psychiatrist, for example, will have difficulties to make his patients face the world as he sees it because the reality of the lower class patients is different from the reality of the middle-class doctor (52). Furthermore, it is rarely in the interest of an older lower class patient to use and to learn the means of communication and the ways of thinking and of feeling which belong to the world of the middle-class psychiatrist. Unless such a patient is a social climber, he will have little use for middle-class values. This state of affairs has been implicitly acknowledged in the fact that little if any individual psychotherapy is done with members of the lower social classes; instead, organotherapy, surgical therapy, chemotherapy, and group therapy prevail in the treatment of these patients.

In the past, social intercourse between members of different castes or classes was strictly regulated. The age-old institution of charity, for example, constituted a means by which people of the higher social classes communicated with people of the lower social classes. The under-privileged exhibited to the privileged their vital needs in terms of food, shelter, clothing, and medicine, and the privileged partially satisfied these needs. Neither group showed its real emotions, and both attended to these activities with the usual masked hostility which accompanies transactions with the out-group. Thus the emissaries of the two classes could meet while each group maintained its own ways of communicating and its own self respect. By denying existent caste and class differences, we have fallen today into the other extreme. For the sake of the therapeutic relationship, we assume that we belong to the same social class as our patients. Although such an assumption is an expression of the values of a democracy, it is a serious handicap to successful therapy inasmuch as it distorts the reality of the situation.

Therapy with members of other religious groups

Psychotherapy undertaken with members of other religious groups who either implicitly or explicitly adhere to the values dictated by their beliefs is extremely difficult. Though therapy can in part be successful without touching upon theological matters (73, 172), most religions prescribe practices which bear upon physical and mental hygiene, eating habits, sexual mores, and the like. Resistances which a patient may have in facing the realities of his situation may be blamed upon the teachings of the church (45). The magic and megalomanic thinking of an immature person frequently is intertwined with religious beliefs, and when these problems are tackled the patient usually becomes more maladjusted than he was before.

Those people who have changed their religious affiliation represent a par-

ticular problem (89). Usually the change of religion (22) is an expression of rebellion against the own family or the in-group; it is an indirect way of hurting the relatives by letting them know that what is dear to them is not dear to our patient. In therapy, then, it becomes important to ascertain whether this rebellion originated in adolescence or in early childhood. If it appeared late, therapy usually is successful; if it appeared early, it is an indication of incomplete or hostile identification, and if in therapy such patients are willing to abandon rebellion they are, in all likelihood, losing their last tie to their family. A person who did not learn to identify successfully in early childhood will have difficulty in learning to identify, with or without therapy, later in life. Removal of the rebellious pattern increases the chances that such patients will become more maladjusted. In many ways it is better that they remain unaware of their deep-seated conflicts and solve their identification problems in terms of religious activities (96).

Therapy with political radicals

Therapy with political radicals is a particular psychiatric problem. At first sight, it seems but natural that different opinions exist about political systems. Upon closer scrutiny (87, 145), however, it becomes quite evident that rebellion against an existing political system, especially on the part of middle-class persons, is related to certain life experiences within the family. Judging from the literature, the problem of the revolutionary has changed little in the course of time; since time immemorial he has devoted his life to rebellion against authority (102). While useful to his own party in the early stages of a social upheaval, the revolutionary may be liquidated once that party has assumed power. Persecution and oppression enable the revolutionary to function well, but once in power he may not know how to act judiciously. Trained to oppose, he eventually will turn against his associates; in need of fight and rebellion, he eventually will make so many enemies that his own position and that of his party are endangered.

Psychotherapy with this type of person indicates that revolutionary interests tend to disappear as soon as the authority problem has been managed. Therapy is promising when the rebellion is of an adolescent type. In such cases, progressive maturation tends to eliminate the acting out of inner conflicts, and some of these patients may later lead satisfactory lives.

Much depends, however, upon the treatment accorded to radicals by the party in power. If the majority party oppresses the revolutionary and allows him to operate in opposition, his rebellious elements are reinforced. If, however, the system asks the rebel to cooperate and to assume responsibility, in terms of forming a lawful opposition or in any other terms, then the rebellious elements are attenuated. If treated as a dangerous indi-

vidual, the rebel will be dangerous; if treated as an ill-guided, a misinformed, or simply a youthful rebel, his destructive power is small and eventually he may fit into the social order.

Therapy with non-identified persons

There are people who, either because of constant environmental change in their early childhood or through inconsistency and lack of continuity in their human relations, never acquired an identity or group membership. These persons do not know who they are; they do not know what they want; they possess so many conflicting and controversial values that their inner existence is really chaotic. They join all sorts of groups and activities, always to discover that that is not really what they wanted. Therapy with these non-identified people consists of helping them (26, 112, 136) to learn the elementary notions about human relations. This is achieved by offering them, over a period of many years, the possibility of acquiring an identity through consistent and continuous contact with one and the same person —the therapist. Thus the patient is enabled to mature.

Therapy with offenders of the law

Therapy with criminals remains difficult (98, 99) because the therapist is, of course, a representative of the majority group which prosecuted and condemned the criminal for his actions. This basic reality in the social situation cannot be undone, particularly when the offender is serving a sentence. Barring emergency conditions, anxiety states, or acute depressions, psychotherapy under duress is ineffective. Furthermore, experiences of prisoners are so restricted and life in prison is so sheltered that the therapy is not supported by a concomitant progress of life experiences. While the magnitude of the crime has little relation to the success of therapy (148), the date of treatment is of relevance. The best time is the period immediately following discharge from the penal institution. But unfortunately there are no institutions which provide for the treatment of discharged prisoners (1).

Punishment by imprisonment tends to reinforce criminal tendencies, and that any beneficial effect upon the personality of the criminal occurs under prison conditions can be seriously doubted (148). However, inasmuch as the judicial machinery, the lawyers, and the law enforcing agencies owe their living to the criminal's existence, a change in thinking and a more scientific attitude in the consideration of offenders of the law can hardly be expected in the near future. Criminals will exist as long as people believe in the existence of criminals, especially if, as here in America, glorification of the criminal is openly accepted. Thousands of people, including women and children, attend the funerals of notorious gangsters; movie makers,

radio and television producers, the designers of funny papers, and the writers of short stories and mystery thrillers consistently advertize crime and remind people of the possibilities of crime. In such an atmosphere, crime will flourish.

Though adolescents are a problem in most cultures, the teen-ager seems to be more of a problem in America than in other western nations. In general, it can be said that people create trouble when they discover that their preparation for forthcoming events is inadequate. This principle applies to the untrained soldier who has to face battle conditions as well as to the teen-ager who is introduced into the world of the adult. Especially in America, adolescents seem to be inadequately prepared to face the tasks of adult life. In Europe and in Asia, adult life is considered the highlight of existence; in America, infancy and childhood are publicly acclaimed as the most gratifying periods of life. Corresponding to these general attitudes, there exist in Europe a variety of youth movements to remind adults that children and adolescents exist, while in America geriatrics and books on how to live after forty are supposed to remind the young people that getting old isn't, after all, quite so bad. While Western European and Asiatic people venerate the wise and the old, American people acclaim the young. Therefore can we blame the American adolescent if he tends to cling to his infantile ways of behavior? To grow up represents for the American teen-ager insecurity and a curtailment of his liberties and privileges; for the European child, in contrast, it means an increase in freedom and in opportunity for self-expression.

For the survival of the nation, orientation towards youth was essential in the early pioneer days. Now that internal frontiers have practically ceased to exist, youthful daring and the courage of the ignorant are less needed than experience, competence, and wisdom. Child-raising practices, however, generally lag somewhat behind other social developments, and in America we are still geared more to the education of frontiersmen and rugged individualists than to the preparation of youth for responsible jobs in government service, business, or industry. Instead of being prepared a little bit more each year for the tasks ahead, the youngsters are raised through grade and high school in an atmosphere of indulgence and freedom; then all of a sudden they are thrown out into the world, quite unprepared to meet the disciplined control required in a modern technical civilization.

No therapy with criminals can be successful unless we change the climate of opinion that promotes crime. Some advances have been made in the treatment of juvenile delinquents (15, 33, 34, 71), and the responsible authorities show a growing understanding for the viewpoint that juvenile delinquents should not be punished but rehabilitated. The same, though on a smaller

scale, is happening with our management of sex offenders (12, 56, 63). But can we bring about institutional and legal reforms without tackling the basic assumptions and the thinking of the people about these matters?

Social factors in the prevention of mental disease

While hindsight helps us to reconstruct the social events which led to the development of mental disorders, foresight aims at preventing the development of mental disorders. In the field of mental hygiene (94) perhaps more than in the field of therapy the understanding of social factors leads to some tangible results. The role of the psychiatrist in the various phases of public life—that is, in industry (62), in civil defense (61), in schools, in colleges and universities, and in medical education (60), in international relations (58), and in community health programs (55) has been summarized in the reports of the Group for the Advancement of Psychiatry. These reports illustrate the widespread social efforts made by psychiatrists, by social workers (54, 59), and by psychologists (57) who believe that human relations are the key factor in the treatment and prevention of maladjustment and mental disease.

Summary

In an attempt to summarize the information we possess on the importance of social factors for therapy, the author arrived at the following tentative formulations:

Social relations are understood best in terms of communication. People relate to each other by means of words, gestures, and actions which convey messages to others. It is the task of the therapist to aid the patient in organizing and correcting his body of information. A workable model of the world and of himself will enable the patient to proceed with appropriate actions, to predict events to come, and to properly evaluate events of the past. This is achieved by helping the patient to properly perceive those cues which are relevant to his human relations and to express in understandable terms his inner thoughts and feelings. Proper social perception and self-expression enable the patient to correct his performance and to keep his body of information up to date.

Improvement of communication can be achieved in various ways. While the psychotherapist and the psychoanalyst work to improve the communication system of the patient functionally, the shock therapist and the neurosurgeon in effect operate on the individual's instruments of communication. But regardless of which method is used, the body of information that a patient possesses about himself and the world can only be corrected, altered, and augmented through real life experiences, of which therapy is one.

Therefore it is imperative that a patient should, during therapy and after, lead as normal a life as possible. Only conditions which approximate the life situations which a patient is going to meet will provide him with the necessary experiences pertaining to work and play and provide for social intercourse with other people, young and old, and with members of the opposite sex. Though therapy at times has to be carried out in an institution, which prevents the patient from having the usual type of life experiences, the majority of therapeutic procedures ought to be aimed at being carried out within the habitual surroundings of the patient. Isolation in institutions and separation of sexes and age groups facilitate administration but do not necessarily improve the patient.

There exists a dynamic balance between external and internal pressures. The greater the external pressure becomes, the less important appear the internal conflicts of the individual, until a point is reached where the external pressure cannot be resisted any longer. When emergencies lead to a breakdown of the patient's adjustment, the realities involved have to be clearly recognized by the therapist so that he can support the patient's existing mechanisms of defense. When emergencies occur during therapy, expressive therapy has to be converted into repressive therapy to the extent of helping the patient to temporarily escape the overwhelming pressure of reality, if this is feasible.

Neuroses and psychoses can be viewed as the result of disturbances which affect a whole group. One individual carries the symptoms, but the group is the diseased organization. Neuroses and psychoses can be viewed as individual patterns of adaptation, and the relatives and friends who fit into such a pattern tend to reinforce the existing pathology. The treatment, therefore, has to embrace the immediate group surrounding the patient and not the patient alone, in spite of the fact that the genesis of such a disturbance may date back to childhood.

Improvement and maturation of any individual seem to depend upon well-functioning human relations, and these involve interaction with single individuals as well as participation in group activities. In individual relations, the participants have greater freedom to shape their interaction, while in group functioning there exists a greater degree of specialization and more rigid organization. While some patients cannot tolerate the fluidity of interpersonal relations, others cannot tolerate the rigidity of group functioning. Therefore individual therapy and group therapy complement each other, rather than to be mutually exclusive.

The therapist's skill is the result of ordinary life experiences as much as of training. The experience of culture change during the formative years seems to be an essential element which provides the future therapist with the psychological tools for understanding others. Training merely organizes

these already existing experiences. Psychiatrists who never experienced culture change during their formative years will tend to become administrators, surgeons, and neuropathologists rather than psychoanalysts, psychotherapist or group therapists.

All forms of psychotherapy and group therapy seem to rely upon differences of values between the therapist and the patient. When the patient and the therapist are too much alike, improvement seems to be slow or absent; and if the doctor and the patient belong to groups which are too different, improvement is likewise slow or absent. Therefore, there seems to exist an optimal difference in the views and the values of patient and doctor under which therapy seems to prosper.

Whenever we undertake therapy with people who belong to different groups we must remember that the social realities are different for the psychiatrist and for the patient. In therapy undertaken by white, upper middle-class doctors with members of different races, ethnic groups, social classes, and religions, the differences between doctor and patient are frequently too great to permit their reaching an understanding. The differences of social reality are reflected in different assumptions made about communication. The dilemma which faces the therapist is as follows: In order that the therapist may understand the patient, the differences in basic assumptions and the differences in social reality have to become the subject of investigation during therapy; and while in some instances this procedure will enable the patient to see his own problems in a different light, helping him to accept his social reality with greater confidence and to become tolerant of other people's social realities, it may in other instances induce the patient to become more isolated. In order to accept his limitations, a person must be rather secure and well established amidst a group of people, otherwise the knowledge of interpersonal differences and limitations may become the cause of despair. The feeling of isolation can only be overcome in therapy by communication with a therapist who shares the basic assumptions made about communication. Therefore, psychotherapy and psychoanalysis with people of basically different groups frequently remain incomplete. Psychotherapy and psychoanalysis can be completed successfully only when a basic equality of opportunity exists for both the patient and the doctor. For only then can the inequalities of achievement be tolerated. If that is precluded, other means of therapy have to be resorted to.

REFERENCES

1. Abrahamsen, D.: Evaluation of the treatment of criminals. Pp. 58-77 in Hoch, P. H.: Failures in Psychiatric Treatment. 241 pp., New York, Grune and Stratton, 1948.
2. Ackerman, N. W. and Jahoda, M.: Toward a dynamic interpretation of anti-Semitic attitudes. Amer. J. Orthopsychiat., *18:* 163-173, 1948.

3. Ackerman, N. W.: "Social role" and total personality. Amer. J. Orthopsychiat., *21:* 1–17, 1951.
4. Adams, W. A.: The Negro patient in psychiatric treatment. Amer. J. Orthopsychiat., *20:* 305–310, 1950.
5. Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J. and Sanford, R. N.: The Authoritarian Personality. 990 pp., New York, Harper, 1950.
6. Alexander, F.: Our Age of Unreason. 371 pp., Philadelphia and New York, Lippincott, 1942.
7. Allport, G. W.: Personality—A Psychological Interpretation. 588 pp., New York, Holt, 1937.
8. Babcock, C. G.: Psychological and psychiatric problems in acculturation. Paper presented to the Chicago Psychoanalytic Society, September, 1951.
9. Bales, R. F.: Interaction Process Analysis. 203 pp., Cambridge; Addison-Wesley Press, 1950.
10. Balint, M.: On the psychoanalytic training system. Int. J. Psycho-Anal., *29:* 163–173, 1948.
11. Bernard, V.: Some aspects of psychoanalysts' attitudes and knowledge regarding minority groups, as these affect the psychoanalytic treatment of patients belonging to these groups. Paper presented at meeting of the American Psychoanalytic Association, Cincinnati, May 3–6, 1951 (to be published).
12. Bowman, K. M.: The problem of the sex offender. Amer. J. Psychiat., *108:* 250–257, 1951.
13. Brown, F. J. and Roucek, J. S.: One America. 717 pp., New York; Prentice Hall, 1945.
14. Burgess, E. W.: The family in a changing society. Amer. J. Sociol., *53:* 417–422, 1948.
15. Cabot, P. S. deQ.: Juvenile Delinquency, a Critical Annotated Bibliography. 166 pp., New York, H. W. Wilson, 1946.
16. California Medical Association, Committee on Medical Economics (of 1950): Doctor and Patient. 16 pp., based on a study by Ernest Dichter, Ph.D.
17. Chapple, E. D. and Lindemann, E.: Clinical implications of measurements of interaction rates in psychiatric interviews. Applied Anthropology, *1:* 1–11, 1942.
18. Clark, R. E.: Psychoses, income, and occupational prestige. Amer. J. Sociol., *54:* 433–440, 1949.
19. Curle, A. and Trist, E. L.: Transitional communities and social reconnection. Human Relations, *1:* 240–288, 1947.
20. Dayton, N. A.: New Facts on Mental Disorders. 486 pp., Springfield, Thomas, 1940.
21. Davis, K.: Mental hygiene and the class structure. Psychiat., *1:* 55–65, 1938.
22. de Sanctis, S.: Religious Conversion. 324 pp., New York; Harcourt Brace, 1927.
23. de Saussure, R.: Psychoanalysis and history. Pp. 7–64 in Roheim, G. (ed.): Psychoanalysis and the Social Sciences, Vol. 2. New York, International Universities Press, 1950.
24. Devereux, G.: The social structure of the hospital as a factor in total therapy. Amer. J. Orthopsychiat., *19:* 492–500, 1949.
25. Devereux, G.: Reality and Dream: Psychotherapy of a Plains Indian. 438 pp., New York, International Universities Press, 1951.
26. Dollard, J. and Miller, N. E.: Personality and Psychotherapy. 488 pp., New York, McGraw-Hill, 1950.
27. Domarus, E. von: Anthropology and psychotherapy. Amer. J. Psychother., *2:* 603–614, 1948.
28. Dublin, L. I.: Factors in American mortality. Amer. econ. Rev., *6:* 523–548, 1916.

29. Dublin, L. I.: The mortality of foreign race stocks. Sci. Mon., *14:* 94–104, 1922.
30. Dublin, L. I. and Baker, S. W.: The mortality of race stocks in Pennsylvania and New York. Quart. Publ. Am. stat. Assoc., *17:* 13–44, 1920.
31. Dunham, H. W.: The social personality of the catatonic schizophrenic. Amer. J. Sociol., *49:* 508–518, 1944.
32. Dunham, H. W.: Social psychiatry. Amer. sociol. Rev., *13:* 183–197, 1948.
33. Eissler, K. R.: Some problems of delinquency. Pp. 3–25 in Searchlights on Delinquency: New Psychoanalytical Studies. 456 pp., New York, International Universities Press, 1949.
34. Ellingston, J. R.: Protecting our Children from Criminal Careers. 374 pp., New York, Prentice-Hall, 1948.
35. Erikson, E. H.: Childhood and Society. 397 pp., New York, Norton, 1950.
36. Faris, R. E. L.: Cultural isolation and the schizophrenic personality. Amer. J. Sociol., *39:* 155–169, 1934.
37. Faris, R. E. L. and Dunham, H. W.: Mental Disorders in Urban Areas. 270 pp., Chicago, Univ. of Chicago Press, 1939.
38. Ferenczi, S.: The further development of an active therapy in psychoanalysis. Pp. 198–217 in Further Contributions to the Theory and Technique of Psychoanalysis, 2nd ed. 480 pp., S. Ferenczi; compiled by J. Rickman. The International Psychoanalytical Library, No. 11. London, Hogarth Press, 1950.
39. Ferenczi, S.: Contra-indications to the "Active" psychoanalytical technique. Pp. 217–230 in Further Contributions to the Theory and Technique of Psychoanalysis, 2nd ed. 480 pp., S. Ferenczi; compiled by J. Rickman. The International Psychoanalytical Library, No. 11. London, Hogarth Press, 1950.
40. Flugel, J. C.: Man, Morals and Society—A Psychoanalytical Study. 328 pp., New York, International Universities Press, 1945.
41. Frank, L. K.: Nature and Human Nature. 175 pp., New Brunswick, Rutgers University Press, 1951.
42. Freud, S.: The future prospects of psychoanalytic therapy. Pp. 285–296 in Collected Papers, Vol. II, 4th ed. The International Psychoanalytical Library, No. 8. London, Hogarth Press, 1946.
43. Freud, S.: An Outline of Psychoanalysis. 127 pp. New York, Norton, 1949.
44. Fromm, E.: Man for Himself: an Inquiry into the Psychology of Ethics. 245 pp., New York, Rinehart, 1947.
45. Fromm, E.: Psychoanalysis and Religion. 119 pp., New Haven, Yale Univ. Press, 1950.
46. Fromm-Reichmann, F.: Notes on the personal and professional requirements of a psychotherapist. Psychiatry, *12:* 361–378, 1949.
47. Fromm-Reichmann, F.: Principles of Intensive Psychotherapy. 246 pp., Chicago, Univ. of Chicago Press, 1950.
48. Frost, I.: Home-sickness and immigrant psychoses. J. Ment. Sci., *84:* 801–847, 1938.
49. Galdston, I. (Ed.): Social Medicine, its Derivations and Objectives. 294 pp., New York, Commonwealth Fund, 1949.
50. Ginsburg, S. W.: Values and the psychiatrist. Amer. J. Orthopsychiat., *20:* 466–478, 1950.
51. Green, A. W.: The middle-class male child and neurosis. Amer. sociol Rev., *11:* 31–41, 1946.
52. Green, A. W.: Social values and psychotherapy. J. Personality, *14:* 199–228, 1946.
53. Green, H. W.: Persons Admitted to the Cleveland State Hospital, 1928–37. Cleveland, Cleveland Health Council, 1939.

54. Group for the Advancement of Psychiatry: Report No. 2. The Psychiatric Social Worker in the Psychiatric Hospital. January, 1948.
55. Group for the Advancement of Psychiatry: Report No. 8. An Outline for Evaluation of a Community Program in Mental Hygiene. April, 1949.
56. Group for the Advancement of Psychiatry: Report No. 9. Psychiatrically Deviated Sex Offenders. May, 1949.
57. Group for the Advancement of Psychiatry: Report No. 10. The Relation of Clinical Psychology to Psychiatry. July, 1949.
58. Group for the Advancement of Psychiatry: Report No. 11. The Position of Psychiatrists in the Field of International Relations. January, 1950.
59. Group for the Advancement of Psychiatry: Report No. 16. Psychiatric Social Work in the Psychiatric Clinic. September, 1950.
60. Group for the Advancement of Psychiatry: Report No. 3. Report on Medical Education. March, 1948. Report No. 17. The Role of Psychiatrists in Colleges and Universities. September, 1950. Report No. 18. Promotion of Mental Health in the Primary and Secondary Schools. January, 1951.
61. Group for the Advancement of Psychiatry: Report No. 19. An Introduction to the Psychiatric Aspects of Civil Defense. April, 1951.
62. Group for the Advancement of Psychiatry: Report No. 20. The Application of Psychiatry to Industry. July, 1951.
63. Guttmacher, M. S.: Sex Offenses, The Problem, Causes and Prevention. 159 pp., New York, Norton, 1951.
64. Hadley, E. E. et al.: Military psychiatry: an ecological note. Psychiatry, *7:* 379–407, 1944.
65. Hall, O.: Types of medical careers. Amer. J. Sociol., *55:* 243–253, 1949.
66. Hallowell, A. I.: Values, acculturation and mental health. Amer. J. Orthopsychiat., *20:* 732–743, 1951.
67. Handley, K. N.: Social casework and intercultural problems. J. soc. Caswk., *28:* 43–50, 1947.
68. Haring, D. G. (Ed.): Personal Character and Cultural Milieu. 670 pp., Syracuse, Syracuse University Press, 1949.
69. Harrington, M.: Wish-Hunting in the Unconscious. 189 pp., New York, Macmillan, 1934.
70. Hartmann, H., Kris, E. and Loewenstein, R. M.: Some psychoanalytic comments on culture and personality. Pp. 3–31 in Wilbur, G. B. and Muensterberger, W., (Ed.): Psychoanalysis and Culture. 462 pp., New York, International Universities Press, 1951.
71. Healy, W. and Bronner, A. F.: New Light on Delinquency and Its Treatment. 226 pp., New Haven, Yale University Press, 1943.
72. Hillpern, E. P., Spaulding, I. A. and Hillpern, E. P.: Bristow Rogers: American Negro; a Psychoanalytic Case History. 184 pp., New York, Hermitage House, 1949.
73. Hiltner, S.: Religion and Psychoanalysis. Psychoanal. Rev., *37:* 128–139, 1950.
74. Hoffer, C. R.: The family-doctor sociometric relationships. Sociometry, *11:* 244–245, 1948.
75. Holt, E. B.: The Freudian Wish and Its Place in Ethics. 212 pp., New York, Holt, 1915.
76. Homans, G. C.: The Human Group. 484 pp., New York, Harcourt Brace, 1950.
77. Honigmann, J. J.: Culture patterns and human stress. Psychiatry, *13:* 25–34, 1950.
78. Horney, K.: The Neurotic Personality of Our Time. 299 pp., New York, Norton, 1937.

79. KAGE, J.: Ego-supportive therapy with displaced persons. Soc. Caswk., *31:* 65–70, 1950.
80. KARDINER, A.: The Psychological Frontiers of Society. 475 pp., New York, Columbia University Press, 1945.
81. KARDINER, A. AND OVESEY, L.: The Mark of Oppression. 396 pp., New York, Norton, 1951.
82. KAUFMAN, M. R.: The patient-physician relationship. Pp. 63–78 in Teaching Psychotherapeutic Medicine, H. L. WITMER (Ed.). 464 pp., New York, Commonwealth Fund, 1947.
83. KINO, F. F.: Alien's paranoid reaction. J. Ment. Sc., *97:* 589–594, 1951.
84. KLUCKHOHN, C.: The influence of psychiatry on anthropology in America during the past one hundred years. Pp. 589–617 in One Hundred Years of American Psychiatry. 649 pp., New York, Columbia University Press, 1944.
85. KLUCKHOHN, C. AND MURRAY, H. A.: Personality in Nature, Society and Culture. 561 pp., New York, Knopf, 1948.
86. KRAL, V. A.: Psychiatric observations under severe chronic stress. Amer. J. Psychiat., *108:* 185–192, 1951.
87. KROUT, M. H. AND STAGNER, R.: Personality development in radicals. Sociometry, *11:* 31–46, 1939.
88. KUBIE, L.: A pilot study of psychoanalytic practice in the United States. Psychiatry, *13:* 227–245, 1950.
89. KUPPER, W. H. AND RUBIN, B. G.: A case study of a proselyte from Catholicism to Judaism. J. nerv. ment. Dis., *107:* 575–578, 1948.
90. LABARRE, W.: Primitive psychotherapy in native American cultures: peyotism and confession. J. abnorm. soc. Psychol., *42:* 294–309, 1947.
91. LANGE-EICHBAUM, W.: The Problem of Genius. 187 pp., New York, Macmillan, 1932.
92. LAWRENCE, R. M.: Primitive Psychotherapy and Quackery. 276 pp., New York, Houghton Mifflin, 1910.
93. LEIGHTON, A. H. AND LEIGHTON, D. C.: The Navaho Door. 149 pp., Cambridge, Harvard Univ. Press, 1945.
94. LEMKAU, P. V.: Mental Hygiene in Public Health. 396 pp., New York: McGraw-Hill, 1949.
95. LEWIN, K.: Frontiers in group dynamics: concept, method and reality in social science; social equilibria and social change. Hum. Relat., *1:* 5–41, 1947.
96. LIEBMAN, J. L. (Ed.): Psychiatry and Religion. (Institute on religion and psychiatry, Temple Israel, Boston, 1947.) 202 pp., Boston, Beacon Press, 1948.
97. LINDEMANN, E.: Individual hostility and group integration. Hum. Organization, *8* (1): 5–9, 1949.
98. LINDNER, R. M.: Rebel Without a Cause. The hypnoanalysis of a criminal psychopath. 296 pp., New York, Grune & Stratton, 1944.
99. LINDNER, R. M. AND SELIGER, R. V.: Handbook of Correctional Psychology. 691 pp., New York, Philosophical Library, 1947.
100. LOMBROSO, C.: The Man of Genius. 370 pp., New York, Scribner, 1891.
101. LOWENTHAL, L. AND GUTERMAN, N.: Prophets of Deceit. 164 pp., New York, Harper, 1949.
102. MCCORMACK, T. H.: The motivation of radicals. Amer. J. Sociol., *56:* 17–24, 1950.
103. MCLEAN, H. V.: Psychodynamic factors in racial relations. Ann. Amer. Acad. Polit. Soc. Sci., *244:* 159–166, March, 1946.
104. MCLEAN, H. V.: The emotional health of Negroes. J. Negro Educ., *18:* 283–290, 1949.
105. MALZBERG, B.: Social and Biological Aspects of Mental Disease. 360 pp., Utica, State Hospital Press, 1940.

106. MEERLOO, J. A. M.: Problems of displaced people. Pp. 113–136 in Aftermath of Peace. New York, International Universities Press, 1946.

107. MEERLOO, J. A. M. AND COLEMAN, M. L.: The transference function: a study of normal and pathological transference. Psychoanal. Rev., *38:* 205–221, 1951.

108. MILLER, J. G. (Ed.): Experiments in Social Process—A Symposium on Social Psychology. 205 pp., New York, McGraw-Hill, 1950.

109. MORENO, J. L.: Psychodrama, First Vol. 429 pp., New York, Beacon House, 1946.

110. MORENO, J. L.: Group psychotherapy, theory and practice. Group Psychother., *3:* 142–188, 1950.

111. MOWRER, E.: A study of personal disorganization. Amer. Sociol. Rev., *4:* 475–487, 1939.

112. MOWRER, O. H.: Learning Theory and Personality Dynamics. 776 pp., New York, Ronald Press, 1950.

113. MULLAHY, P. ET AL.: A Study of Interpersonal Relations. 507 pp., New York, Hermitage Press, 1949.

114. MUNCIE, W. AND BILLINGS, E. G.: A survey of conditions of private psychiatric practice throughout the United States and Canada. Amer. J. Psychiat., *108:* 171–172, 1951.

115. MURPHY, G.: Historical Introduction to Modern Psychology. 466 pp., New York, Harcourt Brace, 1949.

116. NICOLE, J. E.: Psychopathology—A Survey of Modern Approaches, 4th ed. 268 pp., Baltimore, The Williams & Wilkins Co., 1947.

117. NEWCOMB, T. M. AND HARTLEY, E. L. (Ed.): Readings in Social Psychology. 688 pp., New York, Henry Holt, 1947.

118. PARK, R. E.: Race and Culture. 403 pp., Glencoe, Ill., Free Press, 1950.

119. PARSONS, T.: The superego and the theory of social systems. Psychiatry, *15:*15–25, 1952.

120. PARSONS, T.: Illness and the role of the physician: a sociological perspective. Amer. J. Orthopsychiat., *21:* 452–460, 1951.

121. PARSONS, T.: Psychoanalysis and the social structure. Psychoanal. Quart., *19:* 371–384, 1950.

122. QUEEN, S. A.: The ecological studies of mental disorder. Amer. Sociol. Rev., *5:* 201–209, 1940.

123. RANK, O.: Will Therapy and Truth and Reality. 305 pp., New York; Knopf, 1945.

124. RAWLEY, C.: The adjustment of Jewish displaced persons. J. soc. Caswk., *29:* 316–321, 1948.

125. REDLICH, F. C.: The psychiatrist in caricature: an analysis of unconscious attitudes toward psychiatry. Amer. J. Orthopsychiat., *20:* 560–571, 1950.

126. RICE, J. L.: Health for 7,500,000 People. New York City, Department of Health, 1938.

127. RICHARDSON, H. B.: Patients have Families. 408 pp., New York, The Commonwealth Fund, 1945.

128. ROHEIM, G.: Psychoanalysis and Anthropology. 496 pp., New York, International Universities Press, 1950.

129. ROHEIM, G. (Ed.): Psychoanalysis and the Social Sciences, 3 vols. New York; International Universities Press, 1947, 1950, 1951.

130. ROHRER, J. H. AND SHERIF, M.: Social Psychology at the Crossroads. 437 pp., New York, Harper, 1951.

131. ROSEN, J. N.: The treatment of schizophrenic psychosis by direct analytic therapy (with discussion). Psychiat. Quart., *21:* 3–37, 1947.

132. RUESCH, J., HARRIS, R. E., CHRISTIANSEN, C., LOEB, M. B., DEWEES, S. AND JACOBSON, A.: Duodenal Ulcer—A Sociopsychological Study of Naval Enlisted Personnel and Civilians. 118 pp., Berkeley, Univ. of California Press, 1948.

133. RUESCH, J., JACOBSON, A. AND LOEB, M. B.: Acculturation and Illness. Psycho. Mon. Gen. Appl., *62:* no. 5, 1–40, 1948.

134. Ruesch, J., Christiansen, C., Patterson, L. C., Dewees, S. and Jacobson, A.: Psychological invalidism in thyroidectomized patients. Psychosom. Med., *9:* 77–91, 1947.

135. Ruesch, J., Harris, R. E., Loeb, M. B., Christiansen, C. Dewees, S., Heller, S. H. and Jacobson, A.: Chronic Disease and Psychological Invalidism—A Psychosomatic Study. 191 pp. New York, Am. Soc. Res. Psychosom. Probl., 1946. Second Printing: Berkeley and Los Angeles, Univ. of California Press, 1951.

136. Ruesch, J.: The infantile personality: the core problem of psychosomatic medicine. Psychosom. Med. *10:* 134–144, 1948.

137. Ruesch, J.: Social technique, social status and social change in illness. Pp. 117–130 in Personality in Nature, Society and Culture, ed. by C. Kluckhohn and H. A. Murray. 582 pp., New York: Knopf, 1948.

138. Ruesch, J.: Experiments in psychotherapy: I. Theoretical considerations. J. Psych., *28:* 137–169, 1948.

139. Ruesch, J.: Experiments in psychotherapy. II. Individual social techniques. J. Soc. Psychol., *29:* 3–28, 1949.

140. Ruesch, J. and Prestwood, A. R.: Interaction processes and personal codification. J. Personality, *18:* 391–430, 1950.

141. Ruesch, J.: Part and whole. Dialectica, *5:* 99–125, 1951.

142. Ruesch, J. and Bateson, G.: Structure and process in social relations. Psychiatry, *12:* 105–124, 1949.

143. Ruesch, J. and Bateson, G.: Communication, The Social Matrix of Psychiatry. 314 pp., New York, Norton, 1951.

144. St. Clair, H. R.: Psychiatric interview experiences with Negroes. Amer. J. Psychiat., *108:* 113–119, 1951.

145. Sanai, M. and Pickard, P. M.: The relation between politico-economic radicalism and certain traits of personality. J. Soc. Psychol., *30:* 217–227, 1949.

146. Sandi, P. L.: The psychocultural approach in social casework. J. Soc. Caswk., *28:* 377–381, 1947.

147. Sargent, S. S. and Smith, M. W. (Eds.): Culture and Personality. 219 pp., New York, The Viking Fund, 1949.

148. Schmideberg, M.: The analytic treatment of major criminals: therapeutic results and technical problems. Pp. 174–189 in Searchlights on Delinquency; New Psychoanalytic Studies. New York, International Universities Press, 1949.

149. Schroeder, C. W.: Mental disorders in cities. Amer. J. Sociol., *47:* 40–47, 1942.

150. Slavson, S. R.: Analytic Group Psychotherapy with Children, Adolescents, and Adults. 275 pp., New York, Columbia University Press, 1950.

151. Slavson, S. R., Hallowitz, E. and Kinstler, M.: Bibliography in group psychotherapy. Am. Group Therapy Ass'n., New York, 1950.

152. Smith, B. L., Lasswell, H. D. and Casey, R. D.: Propaganda, Communication, and Public Opinion. 435 pp., Princeton, Princeton University Press, 1946.

153. Spaulding, R. G.: Techniques in casework with displaced persons. Soc. Caswk., *31:* 70–77, 1950.

154. Spiro, M. E.: A psychotic personality in the South Seas. Psychiatry, *13:* 189–204, 1951.

155. Stanton, A. H. and Schwartz, M. S.: The management of a type of institutional participation in mental illness. Psychiatry, *12:* 13–26, 1949.

156. Stanton, A. H. and Schwartz, M. S.: Medical opinion and the social context in the mental hospital. Psychiatry, *12:* 243–249, 1949.

157. Steiner, L. R.: Where Do People Take Their Troubles? 265 pp., Boston, Houghton Mifflin, 1945.

158. Sullivan, H. S.: Conceptions of modern psychiatry. Psychiatry, *3:* 1–117, 1940.
159. Sullivan, H. S.: The theory of anxiety and the nature of psychotherapy. Psychiatry, *12:* 3–12, 1949.
160. Sydenstricker, E. Health and Environment. 217 pp., New York, McGraw-Hill, 1933.
161. Szurek, S.: Dynamics of staff interaction in hospital psychiatric treatment of children. Amer. J. Orthopsychiat., *17:* 652–664, 1947.
162. Szurek, S.: An attitude towards (child) psychiatry. Quart. Jour. child Behavior, *10:* 22–54, 178–213, (375–423), 1949.
163. Szurek, S.: Remarks on training for psychotherapy. Amer. J. Orthopsychiat., *19:* 36–51, 1949.
164. Tannenbaum, D. E.: The family agency as a community resource for the adjustment of displaced persons. Soc. Serv. Rev., *25:* 14–18, 1951.
165. Tietze, C., Lemkau, P. and Cooper, M.: Schizophrenia, manic depressive psychosis, and social-economic status. Amer. J. Sociol., *47:* 168–175, 1941.
166. Tietze, C., Lemkau, P. and Cooper, M.: Personality disorder and spatial mobility. Amer. J. Sociol., *48:* 29–39, 1942.
167. Tyhurst, L.: Displacement and migration. Amer. J. Psychiat., *107:* 561–568, 1951.
168. Warner, W. L., Meeker, M. and Eells, K.: Social Class in America. 274 pp., Chicago, Science Research Association, 1949.
169. Winslow, C. E. A.: The Evolution and Significance of the Modern Public Health Campaign. 65 pp., New Haven, Yale University Press, 1923.
170. Winslow, C. E. A. and Wang, P. L.: The relation between changes in nationality stock and increasing death rates in adult life. Amer. J. Hygiene, *14:* 79–88, 1931.
171. Wolff, H. G.: Life stress and bodily disease—a formulation. Pp. 1059–1094 in Life Stress and Bodily Disease. 1135 pp., Baltimore, The Williams & Wilkins Co., 1950.
172. Zilboorg, G.: Psychoanalysis and religion. Atlantic Monthly, January, 1949.
173. Zilboorg, G.: Clinical variants of moral values. Amer. J. Psychiat., *106:* 744–747, 1950.

CHAPTER VII

MILIEU THERAPY

DAVID McK. RIOCH AND ALFRED H. STANTON

Milieu therapy in psychiatry refers to procedures directed toward modification of the environmental part of the patient-environment process with a view to facilitating more satisfactory patterns of interaction—that is, transactions or relationships—in this process. It thus includes all of the field of psychiatric therapy outside of those methods designed to modify the functions of the patient otherwise than through communication broadly conceived. The definition offered here does not exclude psychotherapy as distinct from milieu therapy. Rather, psychotherapy is regarded as a part of the milieu, as also is, for example, the *attitude* of the therapist who uses drugs, electric currents, surgical ablations, and so forth. At first glance a term with such broad connotations would hardly seem useful. In actuality, however, it serves an important purpose in calling to attention a common feature of all psychiatric procedures. The milieu of man as a physical organism may be regarded as air, water, food, other men, and so forth. The milieu of man as a human being has to be described in terms of communication with other human beings, dependent on acculturation (in Sullivan's sense) with cultural values which, as Jurgen Ruesch (24) has pointed out, may be defined as preferred channels of communication. Man is a human being, then, in terms of the reliability of communication in the group of which he is a separate but integral part. This is not the time or place to discuss the theoretical derivation or implications of this concept, though indeed, all the material to be presented in this paper provides substantiating evidence. We wish, rather, to review a number of studies in which the nature of the social matrix and its use in therapy have been more or less directly investigated.

In 1793 Philippe Pinel released the psychotic patients in the Bicêtre from their chains, thereby initiating the institutionalization of the change in our cultural attitude toward emotional disturbances in people. The shift from the excommunicative asylum for the poor and from the guilt-laden luxury of sanitaria for the rich to the concept of an accepting and accepted hospital, expressive of consideration and respect, has been a slow process, not yet completed and still far from being understood. Until recent years it has followed social expressions of humanitarianism on the

one hand and the extension of medical knowledge of nutrition, communicable disease and so forth on the other. The reliable provision of adequate food, housing and protection is a necessary condition for satisfactory human relations, and the current developments in milieu therapy are based on the foundations laid by the medical sciences through the past century and a half. It has been recognized, however, that though the conditions of adequate food and shelter are necessary they are not sufficient to meet the needs of patients in mental hospitals. Consequently a number of methods have been developed to provide facilities for occupational, social, recreational and educational needs of the patients. These have included group and planned activity programs, such as Myerson's "total push" method (20). In addition, new professions have developed in occupational and recreational therapy. Psychiatric social work constitutes one of the more important areas of progress in that it deals with the family and neighborhood relationships of the patients. As these subjects are being discussed in other papers in this symposium, they will not be further considered here except to note that this growth of the activities of the mental hospital, and the consequent increase in its effectiveness, roughly coincide with the historical development of academic departments of the social sciences and with the discovery of methods for investigating and formulating the phenomena of interpersonal transactions. In this area Sigmund Freud's pioneer work in the interpretation of the obscure communications of his patients signalized a revolutionary change in the general scientific attitude toward the study of human performances. Also at the turn of the century Georg Simmel was formulating his brilliant analysis of the field of sociology, much of which has recently been made easily available in an English translation by Kurt Wolff (34). Scientific developments which immediately preceded the emergence of milieu therapy as a technical field in its own right included the contributions of George H. Mead, the social psychologist, of John Dewey, the philosopher, and of Edward Sapir, the cultural anthropologist. The debt American psychiatry owes these three men, who for a number of years were associated at the University of Chicago, has not yet been fully realized. To Mead (17) in particular we are indebted for the delineation of the conceptual frame of reference appropriate to the problems of interpersonal phenomena.

During the past two decades a number of studies which particularly emphasize group communication have been carried out in the field of milieu therapy. Certain of these—including clinical studies with adults and children, and combined psychiatric and sociological studies in mental hospitals—are briefly reviewed in the following pages.

One of the earliest and still one of the major studies was that of Sullivan (31, 32) at the Sheppard and Enoch Pratt Hospital from 1929 to 1931.

This work was based on an observation he made earlier which he described in a personal conversation as follows: "I noticed that schizophrenic patients were not schizophrenic when they were with me. That is, they did not do any of the things that schizophrenic patients are said to do." In developing the admissions ward for young, male schizophrenic patients, Sullivan therefore paid particular attention to the selection of the ward personnel, chiefly with respect to their capacities for understanding and respecting the anxieties and the tangential communications of the patients, and with respect to their capacities for working with himself. The ward was made "special", thereby segregating it from the rest of the hospital and maintaining an atmosphere of a closed, accepting group for the patient to become part of. This atmosphere was also maintained by the selection of patients to be admitted to the ward. In running the ward Sullivan spent relatively little time with the patients themselves, usually only admission and occasional later interviews. He worked intensively, however, in a treatment-training program with the nurses and attendants, using these interviews also for studying interpersonal events on the ward. In this milieu the recovery rate, as measured by return to home or work, of young, first-break, male schizophrenic patients was better than 85 per cent and continued at this level for several years after Sullivan himself had left. The fact that this recovery rate is now no longer surprising, with or without the adjunct of specific procedures, is probably to be explained by the change in attitude of hospital personnel. Patients with the symptoms of "dementia praecox" are no longer automatically considered hopeless, and the rejection by the milieu has been greatly relieved. With the indication of acceptance many patients respond so as to encourage further acceptance and the process feeds back into itself in the direction of more adequate rather than less adequate communication.

The organization of the Chestnut Lodge Sanitarium for the treatment of all its functional psychotic patients with intensive psychotherapy has been described in two papers by Bullard (4) and by Morse and Noble (19). The utilization of an administrator in conjunction with the therapist and the necessity for close collaboration of the whole staff are described. In a number of papers by Fromm-Reichmann on the treatment of schizophrenic patients illustrative incidents are presented of the importance of personnel other than the therapist. In "Principles of Intensive Psychotherapy" Fromm-Reichmann (10) also discusses the attitude of the therapist to the patient's home and family milieu, that is, the need of including the patient's natural group in the course of treatment. In general, the policy at the Chestnut Lodge Sanitarium has been to attempt by psychoanalytic and psychotherapeutic methods to relieve the personal anxieties of the staff (including all of the physicians and a considerable proportion of

the nursing and attendant personnel), to provide minimal guidance in the way of directives, but by a few lectures and numerous staff conferences to develop group understanding to meet the patients' needs.

The Menninger Clinic has been more formally organized, as outlined in several papers by W. C. Menninger (18), Knight (14), and, most recently, by Adams (1). Following the classical medical principle of prescribing treatment on the basis of a careful diagnosis, the patient on admission is extensively studied by medical, psychiatric and psychological methods, and changes during his course in the hospital are carefully assessed. Psychoanalytic principles are used in the diagnostic formulation in terms of which the treatment is outlined, including the prescription of certain occupational and recreational activities and also including prescription of the type of attitude the staff is to maintain to the patient. It is proposed thus to first determine the obscure or unconscious emotional needs of the patient and to meet these needs through all his contacts in the hospital. If a staff member finds he has difficulties in developing the appropriate relationship with the patient he is expected to discuss the matter with the doctor and to work out his own interfering emotional problems.

The development of "the psychiatric team"—consisting of psychiatrist, psychologist, social worker, psychiatric nurse and head ward attendant—in the Neuropsychiatric Section of the Army Medical Service is an example of another approach to the problem of modifying the milieu toward a therapeutic objective. The effectiveness of the team is not in terms of independently operating personnel formally associated in an interdisciplinary unit. Rather, its effectiveness derives from the unification of interest, effort and methods of the team by a common mission to be accomplished. The sense of mission inevitably affects the attitudes of all other personnel involved and the effectiveness of the team is more than the arithmetic sum of the effectiveness of the separate parts. The milieu is further controlled by the careful prognostic assessment of patients for appropriate distribution to hospital wards on the basis of their probable return to duty or evacuation to hospitals further removed from the combat area. The results of treatment in one of the field hospitals during the present war in Korea is reported by Kolansky and Cole (15) as follows: "The average hospital stay of patients was 2 to 3 days. From 65 to 70 per cent of them were returned to duty, of which about 45 per cent went to full duty and the rest to limited duty."

The extensive clinical work of Freeman and Watts in developing the procedure of prefrontal lobotomy has led to a number of observations emphasizing the importance and the utilization of milieu therapy. They use the conceptual model of a child who at first needs to be taken care of and later helped to grow up to express the attitude and function of the

milieu toward the lobotomized patient. The vital role of the milieu is repeatedly stressed in an article on the nursing problem following psychosurgery by these authors in conjunction with Florence R. Ewald (6). They recommend the family milieu in preference to the hospital for the period of convalescence and close their discussion with the following vigorous paragraphs:

"The family must be taught to remain cool, calm, and collected at all times, despite the stress of any given situation. This is reasonable in itself. A child never becomes unduly excited or afraid unless it sees its mother alarmed and panicky. In the same way, a patient will know no fear or excitement unless such fear has its origin in the family or nurse. Pleasant contacts and cheerfulness are conducive to well-being in any individual and are vital in developing prefrontal lobotomy patients into socially acceptable individuals. The manner in which the family co-operates makes the final difference between success and a threatened relapse of the patient.

The nurse herself must be tolerant of all conditions, including patient and family, and must be a go-between for all parties concerned. It is not an easy task, but it can be accomplished, and must be, for the welfare of the patient."

In the field of child psychiatry attention to the milieu has almost been forced on the therapist and combined treatment of one or both parents coincidentally with the treatment of the child is standard practice in many clinics. Studies in the organization of institutions for young children have used the conceptual model of the family as a basis for orientation. One of the classical descriptions of the effect of changing the organization of the milieu is given by Anna Freud and Dorothy Burlingham (7, 8) in their report on their work with children in England during the war. The group organization was changed from a common dormitory with nurses for all children to one in which each nurse took the role of "substitute mother" for a group of four or five children. Anna Freud (7) describes the effect of this change in the structure of the milieu as follows:

"The result of this arrangement was astonishing in its force and immediacy. The need for individual attachment for the feelings which had been lying dormant came out in a rush. In the course of one week all six families were completely and firmly established. But the reactions in the beginning were far from being exclusively happy ones. Since all these children had already undergone a painful separation from their own mother, their mother relationship is naturally burdened with the effects of this experience. To have a mother means, to them equally, the possibility of losing the mother; the love for the mother being thus closely accompanied by the hate and resentment produced by her supposed desertion. Consequently, the violent attachment to the mother substitutes of their own choice was anything but peaceful for the children. They clung to them full of possessiveness and anxiety when they were present, anxiously watched every one of their movements towards the door of the nursery and would burst into tears whenever they were left by them for a few minutes.

"Jealously developed alongside with the mother-attachment. There were two types of jealousy to be seen; one directed against the children of the same family group who actually shared the attention of the mother substitute; or when the children succeeded in accepting

these brothers and sisters who were forced on them, they directed the full impact of their jealousy against the children outside their family group and would not allow their worker to have any dealings with them. For a whole week we really thought that our grand innovation had been a great mistake. The formerly peaceful nursery reverberated with the weeping of children whose 'mother' had left the room, for instance to get something from the next room, and whose absence was mourned as if she would never return. Fights among the children multiplied in frequency and intensity.

"Luckily, this state of affairs did not last longer than two to three weeks. With the realisation that their new mother substitute really belonged to them, reappeared as often as she disappeared and had no intention to desert them altogether, the state of frenzy subsided and gave way to a quieter, more stable and comforting attachment. At the same time, the children began to develop in leaps and bounds. The most gratifying effect was that several children who had seemed hopeless as far as the training for cleanliness was concerned suddenly started to use the pot regularly and effectively. . . . The intimacy of bathing time in the evening . . . has had a remarkable effect on the development of speech. All the children in the group have greatly enlarged their vocabulary. And several children who were rather backward in their speech development due to nursery life have now, under the influence of this new stimulus, made up for these arrears."

For older children the conceptual model of a "family"—in a narrow sense—has not been found useful for structuring the milieu of treatment institutions. However, the concept of "home" as signifying reliable continuity of concern and respect by particular adults for all the aspects of the children's lives and for the group as a part of the community has been found to be important. Some of the most careful and complete clinical studies of milieu therapy have been carried out in this area by Bettelheim and his collaborators at the Orthogenic School of the University of Chicago and by Redl and his collaborators at Pioneer House and Wayne University in Detroit.

Bettelheim (2) discusses the problems among older children of attempts frequently made to identify an institution as a "home", with its implicit demand upon a child for affection which the child is unable and unwilling to give early in his stay in the institution. He describes in detail the operation of a therapeutically designed organization and the way in which child-staff interaction, often in the most routine activities, has therapeutic import. With Sylvester (3), he earlier made explicit his concept of "psychological institutionalism" as a deficiency disorder in the emotional sense with a general impoverishment of the personality and, more specifically, the lack of a conception of coherence of time, space, and person. Life was organized into specific activities—washing, dressing, and eating, with the accompanying bodily pleasures—instead of around interpersonal experience with particular adults. Children suffering from this disorder were unable to differentiate among staff members by name. There was a serious lag in ability to handle a one-to-one contact with an adult, and an egocentric preoccupation with functions of the body. He attributes the disorder

to the institutional environment which stresses depersonalized rules, order, compliance with rules at the expense of spontaneity and the development of internal controls, and the care of the child by several different staff members without permitting adequately prolonged and close contact with one adult.

In contrast, they describe a therapeutic milieu as one with an emphasis on spontaneity and flexibility, not license or chaos, highly individualized interpersonal relationships within which all simple activities are carried out, giving them a wider meaning, They offer cases to illustrate the effect of such a milieu.

Redl and Wineman (22) briefly sketch a number of the characteristics of the interpersonal and intergroup relationships developed at Pioneer House in Detroit. They make the point that a "psychologically hygienic atmosphere" for the treatment of disturbed children is just as essential as a bacteriologically hygienic atmosphere is for the success of many other forms of medical procedures. The thesis emphasizes that all the modes of communication with the children must be *consistently* directed toward the end of developing a stable sense of belongingness, not only with the institutional group, but also with the community. Redl and Wineman point out that this principle applies equally to such treatment settings as summer camps, special day schools, and to office interviews as it does to prolonged institutional treatment. "Whether partial or total, whether supportive or direct, in all ... cases we want to design at least a piece of the child's environment so as to fit the whole child in a treatment-favorable way. We deal with the whole child in a total life situation even if only for a short time span, and with children this invariably means acting, not talking or fantasying only."

The objective of the studies from which the foregoing examples have been selected was primarily to improve the therapeutic value of the institutions concerned. Secondarily they have contributed a large body of data to our understanding of the person in terms of his integration in his milieu by communication. It becomes ever clearer that not only is the operational (or scientific) definition of a person necessarily in terms of his transactions with the milieu (Spiro (27), Sullivan (30, 33), Ruesch (24), Riezler (23), Zaniecki (35), etc.), but also that the consideration of the attitudes directly and indirectly communicated to a patient by the milieu is of vital importance in therapy. In recent years a number of more academically oriented studies have been undertaken. These have proposed to examine group structure and integration in mental hospitals with particular reference to staff-staff and staff-patient relationships. In such investigations attention has been directed to the description of the formal and informal structure of the groups, to the sociologic factors and to the cultural values. For instance, Caudill and the Yale group (5) emphasize the great im-

portance of informal groups of patients in the mental hospital in determining the character of the signs of illness. In a combined psychiatric and sociological study of a disturbed ward at the Chestnut Lodge Sanitarium, one of us, in collaboration with Morris Schwartz (28, 29), described particular configurations of the personnel-patient matrix of which certain well defined "symptoms" formed one part. For instance, persistent pathological excitement shown by patients was found in this particular setting to be regularly accompanied by a similarly persistent secret disagreement between staff members who were in direct contact with the patient—and resolution of the interference of communication between the staff members was regularly accompanied by diminution of the excitement suffered by the patient. In the course of the same study a number of observations (not yet published) were made on the problem of suicide. Suicidal preoccupations or attempts were found to occur with marked regularity in certain patients when the patient formed a relatively close relationship with a member of the personnel whose attitude was consistently, covertly moralistic—that is, whose communications to the patient were colored by the message that the patient was fully acceptable only contingent upon a change in his character but was partially acceptable without it. This two-person group of staff member and patient was accepted by the rest of the staff ordinarily in a relatively matter-of-fact way, rather than being the source of intrastaff conflict. In this case also, when the nature of the relationship was changed, or when it was interrupted and replaced by others of a different type, the suicidal preoccupation ceased, recurring only when another such relationship occurred. These studies have highlighted the importance of the milieu by identifying relatively specific parts of it which were *anti-therapeutic* in specific ways. Further, they emphasize that a therapeutic milieu is not achieved by good intentions alone; both conscious and unconscious interactions of both staff and patients compose a therapeutic milieu or its opposite, or a mixture of both.

Szurek has also studied the problem of staff-staff interrelations and the different relations of staff members in different roles with the children in a children's psychiatric ward, with similar findings. In a paper with Sheimo and Paynter (26) the correlation of staff-staff disagreement with destructive gang formation amongst the children is described in a detailed running account of an incident, together with the solution of the problem when the disagreement between the staff members was resolved.

Investigations of milieu therapy have been carried out almost entirely in mental hospitals and other treatment institutions. They have thus been concerned with imposed or contrived groups, with only occasional attention to more or less naturally occurring sub-groups within the larger unit. Even when consideration has been given to contacts with the social units

from which the patients came it has rarely extended beyond the patients' immediate families. Naturally occurring sub-groups on mental hospital wards have been described by Caudill (5) and by Schwartz (25). It is to be noted, however, that such groups are formed very largely to meet immediate needs for communication. The significance of the patterns of communication in these groups is of short duration—that is, the groups do not have a reliable, long-term purpose, and no member of the groups can either count on, nor be expected to be responsible for, long-term consistent performance directed toward a common goal for the group. Indeed, individual members of these groups express the desire to leave the hospital—which includes the sub-group—and rejoin their natural family or social groups.

The importance of the natural social group in a community with its years (sometimes generations) of reliability has been explored by the Soil Conservation Service of the Department of Agriculture.[1] Realizing that the task of soil conservation could not be accomplished in time by the available workers dealing with individual farmers, members of the Service began, over 15 years ago, to investigate the possibilities of working with groups. After futile attempts to enlist the collaboration of various "man-made" groups, such as the grange, political clubs and so forth, attention began to be paid to natural groups. The move in this direction was in part on the advice of a consultant in sociology—John P. Shea, employed by the Service—and in part on interest early in World War II to determine natural population units for defense organization. It is not known just how the discovery was eventually made, or who was responsible, but the Soil Conservation Service has found that the vast majority of farm families were already informally organized in what the Service now calls "neighbor groups". The term does not refer to geographical contiguity, but to that group of families who get together for social and informal occupational discussions and activities. The "neighbor group" rarely consists of less than five and never (in 45,000 groups identified) of more than twelve families. There is always a key member as the center of the informal organization whose opinions as to the desirability of considering, testing or trying out a new proposition are of prime importance. The neighbor group, in contrast to most individuals, does not accept new propositions

[1] No detailed record of the studies by the Soil Conservation Service on "neighbor groups" in rural communities has been published. The following account is based on personal communications from Alfred M. Hedge, assistant chief of operations of the Soil Conservation Service, and from Edward T. Hall, associate professor of anthropology in the Foreign Service Institute of the Department of State, as well as on three short articles in *Soil Conservation*, the official organ of the Soil Conservation Service by Hedge and Ream (11), King (13), and Ream and Morris (21). A more technical summary of the results of the studies by the Service is to be found in Loomis and Beegle (16).

in the form presented. In the neighbor group "ideas are stripped of fancy trapping, discussed, analyzed and revised" both in general terms and in terms of their application to peculiar local conditions (11). When a neighbor group takes up the proposition of soil conservation the effect is greater than the mere enlisting of the additional number of farms involved; it includes the enthusiasm of a collaborative enterprise.

It may be noted in passing that the importance of the neighbor group principle is emphasized by the negative implications of national advertising and personal salesmanship methods. Soil conservation is a necessary job to be done, requiring immediate sacrifice for ultimate gain. There is an unquestioned desire to improve the methods, without regard to the prestige or personal financial gain to the person responsible for the improvement. In advertising and salesmanship the objective is to sell a particular product for the gain of a corporation or a person. In advertising and selling it is important to avoid genuine analysis or revision and the "fancy trapping" is brought startlingly into the foreground, preferably with dazzling brilliance. Consequently, advertising is to the mass and salesmanship is directed to the individual when he is alone. Both techniques are directed at splitting the "neighbor group" and appealing to personal prestige, comfort, or threat of anxiety, with the fictitious reassurance of being like or *better than* everyone else.

Without going into a discussion of the more academic sociological studies of natural social groups, (such as those of Homans (12), of Loomis and Beegle (16), etc.) we wish to mention certain implications for psychiatry. In the first place, endeavoring to "sell" mental hygiene to the community as a whole is probably an operation in which cohesion of the group is verbalized while dismemberment is being enacted. Mental hygiene or preventive psychiatry is rather a job to be worked out with and by "neighbors" to meet the peculiar conditions of their neighborhood. Secondly, with the facilities as they at present exist in almost all large mental hospitals, the proposition of dealing with the natural groups from which the patients come is virtually impossible. It is therefore necessary to develop hospital groups to which the patients may belong and, in belonging, may develop a sense of security. The separation from the original milieu which is involved cannot be dealt with adequately by seclusion or hospitalization, and certainly not by coercion. It requires an understanding and understandable invitation to join a new group, which has a sense of being "special" or "different", and possibly the implication of superiority in its special or different character. It is in this area that Fromm-Reichmann's concepts of the assets of the emotionally handicapped (9) are of particular importance. On the basis of the security of reliable belongingness to a hospital group the patient can tolerate the pressures of social status. In

this regard the needs of the emotionally disturbed are more acute, but not different in kind, to the needs of all of us.

Finally, in view of the manifest importance of the long-term group relations in natural neighbor groups, its importance in influencing what happens in the psychiatric interview in office practice should not be underestimated. There is a significant difference between a patient's trying out a new mode of behavior in a group which is only of temporary significance to him, and his trying out the same behavior in a group in which he expects to live for an indefinite period. The appraisal of the patient's position in such a group promises to considerably increase the therapeutic effectiveness of the psychiatrist in the hospital, in the clinic, or in office practice.

REFERENCES

1. Adams, Edward C.: Problems in attitude therapy in a mental hospital. Amer. J. Psychiat., *105:* 456–461, 1948.
2. Bettelheim, Bruno: Love is not enough: the treatment of emotionally disturbed children. 386 pp., Glencoe, Illinois, The Free Press, 1950.
3. Bettelheim, Bruno and Sylvester, Emmy: A therapeutic milieu. Amer. J. Orthopsychiat., *18:* 191–206, 1948.
4. Bullard, Dexter M.: The organization of psychoanalytic procedure in the hospital. J. Nerv. Ment. Dis., *91:* 697–703, 1940.
5. Caudill, William, Redlich, F. C., Gilmore, H. R. and Brody, E. B.: Social structure and interaction processes on a psychiatric ward. Amer. J. Orthopsychiat., *22:* 314–334, 1952.
6. Ewald, Florence R., Freeman, Walter and Watts, James W.: Psychosurgery: the nursing problem. Amer. J. Nursing, *47:* 210–213, 1947.
7. Freud, Anna and Burlingham, Dorothy: War and children. 191 pp., New York, Internat. Univ. Press, New York, 1944.
8. Freud, Anna and Burlingham, Dorothy: Infants without families: the case for and against residential nurseries. 128 pp., New York, Med. War Books, Internat. Univ. Press, 1944.
9. Fromm-Reichmann, Frieda: Remarks on the philosophy of mental disorder. Psychiatry, *9:* 293–308, 1946.
10. Fromm-Reichmann, Frieda: Principles of intensive psychotherapy. xviii + 246 pp., Chicago, Univ. of Chicago Press, 1950.
11. Hedge, Alfred M. and Ream, Howard W.: Natural groups speed conservation. Soil Conservation: Official Organ of the Soil Conservation Service, *17:* 9–11, 1951.
12. Homans, George C.: The human group. xxvi + 484 pp., New York, Harcourt Brace & Co., 1950.
13. King, Barrington: Conservation in North Carolina: one for all, and all for one. Soil Conservation: Official Organ of the Soil Conservation Service, *17:* 12–16, 1951.
14. Knight, Robert P.: Psychoanalysis of hospitalized patients. Bull. Menninger Clin., *1:* 158–167, 1937.
15. Kolansky, Harold and Cole, Richard K.: Field hospital neuropsychiatric service. U. S. A. F. Med. J., *2:* 1539–1545, 1951.
16. Loomis, Charles P. and Beegle, J. Allen: Rural social systems: a textbook in rural sociology and anthropology. xxvii + 873 pp., New York, Prentice Hall, Inc., 1950.

17. MEAD, GEORGE H.: Mind, self and society. xxxviii + 401 pp., Chicago, Univ. of Chicago Press, 1934.

18. MENNINGER, W. C.: Psychoanalytic principles in psychiatric hospital therapy. Southern Med. J., *32:* 348–354, 1939.

19. MORSE, ROBERT T. AND NOBLE, DOUGLAS: Joint endeavors of the administrative physician and psychotherapist. Psychiat. Quart., *16:* 578–585, 1942.

20. MYERSON, ABRAHAM: Theory and principles of the "total push" method in the treatment of chronic schizophrenia. Amer. J. Psychiat., *95:* 1197–1204, 1939.

21. REAM, HOWARD W. AND MORRIS, G. M.: Crowds are made up of clusters. Soil Conservation: Official Organ of the Soil Conservation Service, *16:* 199–200, 1951.

22. REDL, FRITZ AND WINEMAN, DAVID: Children who hate. 253 pp., Glencoe, Illinois, The Free Press, 1951.

23. RIEZLER, KURT: Jack and Jill: considerations of some basic sociological concepts. Social Research, *6:* 489–501, 1939.

24. RUESCH, JURGEN AND BATESON, GREGORY: Communication: the social matrix of psychiatry. vi + 314 pp., New York, W. W. Norton and Co., 1951.

25. SCHWARTZ, MORRIS S.: Social interaction on a disturbed ward of a mental hospital. Unpublished dissertation, Dept. Sociology, Univ. of Chicago, 1951.

26. SHEIMO, S. L., PAYNTER, J. and SZUREK, S. A.: Problems of staff interaction with spontaneous group formations on a children's psychiatric ward. Amer. J. Orthopsychiat., *19:* 599–611, 1949.

27. SPIRO, MELFORD E.: Culture and personality; the natural history of a false dichotomy. Psychiatry, *14:* 19–46, 1951.

28. STANTON, ALFRED H. AND SCHWARTZ, MORRIS S.: The management of a type of institutional participation in mental illness. Psychiatry, *12:* 13–26, 1949.

29. STANTON, ALFRED H. AND SCHWARTZ, MORRIS S.: Observations on dissociation as social participation. Psychiatry, *12:* 339–354, 1949.

30. SULLIVAN, HARRY STACK: Conceptions of modern psychiatry. Psychiatry, *3:* 1–117, 1940; *8:* 177–205, 1945; Washington, D. C., William Alanson White Psychiatric Foundation, vii + 147 pp., 1947.

31. SULLIVAN, HARRY STACK: The modified psychoanalytic treatment of schizophrenia. Amer. J. Psychiat., *10:* 519–540, 1931.

32. SULLIVAN, HARRY STACK: Socio-psychiatric research: its implications for the schizophrenia problem and for mental hygiene. Amer. J. Psychiat., *10:* 977–991, 1931.

33. SULLIVAN, HARRY STACK: The illusion of personal individuality. Psychiatry, *13:* 317–332, 1950.

34. WOLFF, KURT H.: The sociology of Georg Simmel. lxiv + 445 pp., Glencoe, Illinois, The Free Press, 1950.

35. ZANIECKI, FLORIAN: Social groups as products of participating individuals. Amer. J. Sociol., *44:* 799–811, 1939.

CHAPTER VIII

A RESEARCH PROGRAM IN CLIENT-CENTERED THERAPY

CARL R. ROGERS

This paper presents a research program which is in progress at the Counseling Center of the University of Chicago, rather than presenting any of our completed research studies. This somewhat unusual decision was made because it is believed that the design and methodology of our current research program may represent a real contribution to a field which is very new, and in which research is little utilized.

Psychotherapy, depending as it does upon the most subtle of interpersonal relationships, upon unverbalized as well as verbalized experience, is admittedly a most difficult field to enter with research tools. Client-centered therapy, with its minimal emphasis upon manipulation, with the therapist defining his function as primarily that of creating a climate of maximum safety in the relationship, and acceptant understanding of the client's own perceptual field, presents fewer confusing variables for study, and it is perhaps because of this that research has already made a significant start in this type of therapy. Certainly the current program owes much to the more than forty studies of psychotherapy which have already been completed in this orientation, studies which have already been presented or described. (See references (4) and (6) for overviews of this research.)

A PROGRAM DESIGN

The extensive research which is now being carried on by a group of our staff members, with plans extending over a number of years,[1] is of the sort which might be called a program design. Marquis defines program design as "the planning of an integrated series of research activities focussed on a central problem and involving a number of scientists for several years" (3). We have endeavored so to plan our comprehensive study as to develop a flexible, ongoing design in which many therapists and research workers of varying shades of opinion might find a congenial conceptual framework

[1] The research is already assured of a five year life, thanks to generous grants from the Rockefeller Foundation, through its Medical Division. The planning of the program has been described in a paper by Gordon et al. (1).

in which to attack related problems in a related fashion. One of the important ways in which we have done this is to plan successive blocks of research cases, in each of which a group of studies will be made, but with common elements in the research design for all blocks, so that some overall conclusions will be possible. We now have four blocks underway. Block I, to which I will devote the remainder of this paper, is concerned with specific questions about the outcome and the process of therapy. Block II is a small block in which exhaustive study is being made of the therapeutic relationship as it changes in the course of the interviews. Block III is primarily methodological, utilizing four different tests to see which test throws the most light on therapeutic change. Block IV is concerned with the relationship, if any, between the process of psychotherapy and the functioning of the individual in perceptual tasks.

The overall purposes of the program are threefold: 1) to investigate the internal dimension of therapy—the discovery of the lawful elements in the process of therapy which are involved in the reorganization of personality; 2) to investigate the external dimension of therapy—the measurement of the correlates of therapy in the larger psychological, physiological and sociological field of the individual; and 3) to relate these findings to current personality theory, and to further the development of personality theory.

It is our purpose to make every aspect of these studies objective. Hypotheses are stated in operational terms. Instruments are chosen for their adequacy in testing the hypotheses. All of the data, including the recorded interviews, is to be available to research workers and publicly communicable, so that any part of the study may be replicated by others. The variables studied are to be controlled in appropriate ways. In other words, the studies made are to fulfill the canons of science, as laid down in any field.

THE DESIGN OF BLOCK I

In our first block of cases we selected for testing a group of hypotheses which had been drawn from the developing theory of client-centered therapy, (4, chapter 11) and which had to do with the outcomes and the process of that therapy. I cannot take the time here to give you the derivation from theory of each hypothesis, nor to state these in the operational form in which they were cast, but I will give the general form of the different hypotheses, and the instrumentation for each. (For a more complete description of this project see Grummon (2).) More hypotheses could of course have been included, but we were limited to the amount of research time which could be asked of our clients, without unfavorably influencing motivation for the task, or the course of therapy.

The first hypothesis had to do with the degree of global personality change in therapy. It was hypothesized that where a client has completed

a series of client-centered interviews there will be significant differences in the total personality picture indicative of greater integration and better adjustment. After considerable investigation, the Thematic Apperception Test was selected as the instrument for this study. TATs were given prior to therapy, after therapy, and at a followup point six to twelve months after the conclusion of therapy. These TATs are to be given to an expert who knows nothing of the case, or even whether the individual was in therapy. He is to be asked to place them in an order from most poorly adjusted to best adjusted. It is predicted that this order will coincide with the order in which they were given. More detailed analyses will also be made of the TAT protocols.

The second study is made up of a cluster of hypotheses in regard to the changes in the perceived self of the client as a concomitant of therapy. In this study we have made extensive use of the newly devised Q-technique, particularly as developed by Stephenson (7, 8). A large trait-universe of self-descriptive statements was drawn from recorded interviews and other sources. A random sample of 100 of these, edited to make them clear and unambiguous, was selected as the instrument to be used and each statement was printed on a card. The client was asked to sort these cards into nine piles, placing the traits most characteristic of himself at one end of the distribution, and those least like himself at the other. This gives a detailed and objective picture of the self as perceived by the client. A second task was to sort the cards to represent the self he wants to be, or would like to be, his ideal self. A third task was to sort them to represent the characteristics of the ordinary person. This threefold task was performed by each research client before therapy, at intervals during therapy, at the conclusion of therapy, and at the followup point six to twelve months later. These various sortings are all being correlated with each other, and also analyzed by means of factor analysis to throw light on such questions as: Does the perceived self change in therapy? Does the wanted self change? Do they become more congruent? Do they change during the followup period? Does the perception of others change? There are many further aspects of this study which I cannot go into here, but the preliminary findings, such as the increased congruence between the perceived and the wanted self, are interesting and bear directly on the theory of client-centered therapy. The Q-technique seems admirably adapted to an intensive and refined investigation of completely subjective phenomena in a thoroughly objective fashion.

A third study in this first block has to do with changes in the maturity of behavior. It is hypothesized that following the completion of client-centered therapy the behavior of the client will be rated, both by himself, and by those who know him well, as being more emotionally mature, using the concept of emotional maturity as established by experts. The instru-

ment chosen for this study has several flaws, but seemed the best available. It is the Willoughby Emotional Maturity Scale. Ratings are obtained from the client, and from two good friends, before and after therapy, and at the followup point.

Another study in Block I also grows out of the theory of therapy, and has to do with changes in attitudes toward others. It is hypothesized that after the completion of client-centered therapy the individual will demonstrate through his attitudes and his behavior more acceptance of others than was demonstrated before therapy. For the instrumentation of this study a Self-Other Scale was compiled, based upon three existing attitude scales. A role-playing test was also utilized. As with the other studies, these tests were administered before and after therapy, and at the followup point.

In addition to these investigations of the outcomes of psychotherapy, several studies are also underway on the process of therapy. Since most of the studies of process are based on the sound recording of the interviews, or on the transcript of these recordings, and since both of these will be permanently available, other studies will no doubt be developed in the future, as we wish to investigate new aspects of the therapeutic process. One study already under way is investigating the extent to which new perceptions of self emerge in therapy, and whether the rate of emergence is correlated with other measures of change. A second study has been completed of the client's verbal behavior in therapy, endeavoring to investigate the underlying pattern of change in the categories of verbal behavior. A third process study is concerned with the identification of those points in therapy which are regarded by the therapists as "deep". An analysis will then be made of the objective differences between these segments of therapy and other segments chosen at random. A fourth study is getting underway to study the manner in which material enters awareness. Elements are identified which are evident in the TAT, but not in the client's initial (and conscious) perception of himself. The way in which some of these elements come into the awareness of the client in the interviews, so that they form a part of his later perception of himself, is the concern of this study.

Perhaps this brief description will give some hint of the complex series of interrelated hypotheses as to process and outcomes which are being studied in the first group of our research clients.

THE POPULATION: EXPERIMENTAL AND CONTROL

It was determined early that we regard it as more valuable to make an exhaustive investigation of a relatively small group of cases, with good controls, rather than a superficial study of a large number. Consequently we decided upon 25 experimental cases for Block I. These clients were chosen in such a fashion as to be representative of the clients coming to the

Counseling Center, with the selection to be essentially random. Actually the group will be somewhat larger than 25. Twelve therapists have participated in the therapy.

We have an adequate control feature built into every portion of the study. Two of the major controls will be described. A control group in which the members are matched with the experimental group for age, sex, education and socioeconomic status, are being given the full battery of research instruments at the same intervals as the members of the research group, but receive no therapy. The data will indicate whether the various hypothesized changes occur simply as a result of time or only as a result of therapy. To control for personality variables and the desire for therapy was more difficult. For this purpose we are using what we called the Own-Control group. Approximately half of the experimental clients are in this group. These clients were given the initial test battery when they came to the Center requesting help. They were then asked to wait for sixty days, without therapy. At the end of this time the battery was repeated before therapy was initiated. These clients like the others, were tested again after therapy and at the followup point. In this way each of these clients is matched with himself, and the sixty day period will indicate whether a client of a specific personality, who desires therapy, changes spontaneously during the sixty day no-therapy period, or only during therapy, or neither, or both. These two examples will suggest the way in which we have tried to control the significant variables in the various portions of our research.

THE PROBLEM OF DATA COLLECTION

Since few workers are acquainted with the problems of research in this field, it might be mentioned that many problems of professional ethics must be met as well as technical problems of equipment. The recording and transcribing of the interviews and the test responses is a problem with many difficult facets. It may provide a hint of the magnitude of such an undertaking to state that in one forty-interview case, it takes an investment of nearly 700 hours of time to transcribe and prepare all the material for analysis. This does not involve any of the time spent in planning the research, nor does it cover the analysis of the data. It is entirely time involved in the collection of the data, and its preparation to the point where it can be used.

AN EXAMPLE OF THE TYPE OF FINDING

A small fragment of our early findings in this research will indicate the sort of objective statements which it will be possible to make about psychotherapy. It will be recalled that the Thematic Apperception Test has been used to measure the degree of global personality change, and the Q-technique to measure personality changes in the perceived self. The fragment

which I shall report is from an investigation which is attempting to study the relationship between these two—between change as observed diagnostically from an external frame of reference, and change as viewed subjectively from an internal frame of reference.

Our hypothesis was that during and after therapy there would be an increasing congruence between the self as perceived by the client, and the client as perceived by a diagnostician. The theoretical rationale for the hypothesis was that if material which had been denied to awareness entered awareness during therapy, it would become organized into the self, and thus the self would become more like the diagnosis. I will illustrate the findings from one case, which is being reported more fully elsewhere (5).

In this case we had Q sorts of the self and of the wanted self during 6 months of therapy (40 interviews) and a 12 month followup period. We also had TATs administered at intervals during this 18 month period. We asked a psychologist who knew nothing of the case, or its outcome, or the order in which the TATs were given, to take each TAT and after studying it, to sort the Q-cards to represent the client as she actually was, diagnostically, at that point. We could then compare the self and the diagnosis objectively by correlating the different sortings. Figure 1 contains a few of these correlations.

These findings seem to be among the most evident.

1. The wanted self, or ideal self, changes relatively little during the whole period (correlation over whole period = .72).
2. The self changes markedly over the period (r = .30).
3. The pre-therapy self as *remembered* at the followup point is even more discrepant from the final self (r = −.13).
4. The diagnostic sortings show a radical change from first to last, an even greater change than in the sortings for the perceived self (r = −.33).
5. Before therapy there is no relationship between diagnosis and self (r = .00) and a strongly negative relationship between diagnosis and wanted self (r = −.42).
6. At the final followup there is a strongly positive relationship between diagnosis and self (r = .55). Our hypothesis is thus upheld in this case. There is also a substantial positive relationship between diagnosis and wanted self (r = .46).
7. The change in the perceived self occurs most markedly during therapy rather than during the followup (r of .39 compared to an r of .65). The change in the diagnosis occurs more markedly during the followup period, rather than during therapy (r of .15 compared with r of .52).
8. At the final followup the client has, in her perceived self, become substantially the self she initially wanted to be (r = .70). By this same time she has changed diagnostically from being very unlike

her initially wanted self (r = .−42) to being substantially *like* her initially wanted self (r = .61).

There are many implications of these findings which are surprising, and which call for further study in a whole group of cases. They are presented here simply to suggest the richness, the refinement, and the objectivity of the findings which are possible under the research design I have described.

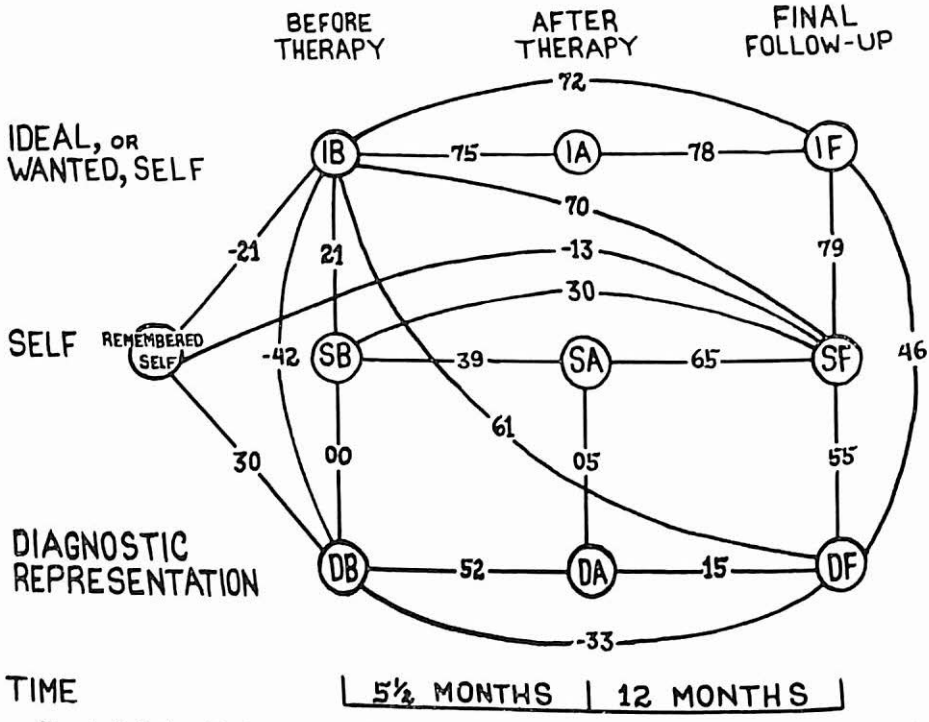


Fig. 1. Relationship between self, self-ideal, and diagnosis. Figures are correlations between Q-sorts with decimal points omitted.

OUR APPROACH TO THE CRITERION PROBLEM

What is the criterion for research in psychotherapy? There is widespread acceptance of the notion that the purpose of research in this field is to measure the degree of "success" in therapy, or the degree of "cure" achieved. While we have not been uninfluenced by such thinking, we have given up these concepts because they are not scientifically basic. There is no general agreement as to what constitutes "success" whether it is removal of symptoms, resolution of conflicts, improved social behavior or some other description. There is much evidence that the concept of "cure" is entirely inappropriate, since in most of these disorders we are dealing with learned behavior, not with a disease.

As a consequence of our thinking we are not asking, in our research, "Was success achieved? Was the condition cured?" Instead we are asking

a question which scientifically is much more defensible, namely, "What are the concomitants of therapy?" Each orientation to psychotherapy predicts, and describes theoretically, certain changes which occur in therapy. The purpose of our research is to determine, "Do the various changes which are hypothesized, actually occur in measurable degree?" Once we are able to state, for example, that client-centered therapy tends to produce changes *a*, *b*, *d* and *f*, but does not produce changes in variables *c* and *e*, then each professional person, or the community in general, can make the value judgement as to whether it regards those changes as desirable, and hence as constituting "success". We believe that this is the line of thought which is most deeply in accord with scientific method, and that it holds the greatest promise of producing not only new learnings about psychotherapy, but about the effective dynamics of personality change.

SUMMARY

I have endeavored to give a very abbreviated picture of a comprehensive and continuing research program in client-centered psychotherapy, which will be reported much more fully in forthcoming publications. I have emphasized the fact that it involves hypotheses derived from theory, operationally tested in groups of experimental clients during therapy and after, with adequate control groups and control features in accordance with sound scientific methodology. Hypotheses will be concerned with every aspect of therapy, though the only ones mentioned in this paper have to do with the process and outcomes of therapy in the client. The findings will be related not only to the practice of therapy, but to a developing theory of personality dynamics.

REFERENCES

1. Gordon, T., Grummon, D. L., Rogers, C. R., and Seeman, J.: Studies in client-centered psychotherapy. I. Developing a program of research in psychotherapy. Psych. Service Center Jour., *3:* Mar.–June 1951, pp. 3–28.
2. Grummon, Donald L.: Studies in client-centered psychotherapy. II. Design, procedures and subjects for block I. Psych. Service Center Jour., *3:* Mar.–June 1951, pp. 29–46.
3. Marquis, Donald G.: Research planning at the frontiers of science. Am. Psychol., *3:* 430–38, 1948.
4. Rogers, Carl R.: Client-Centered Therapy. New York, Houghton Mifflin, 1951.
5. Rogers, Carl R.: Studies in client-centered psychotherapy. III. The case of Mrs. Oak—a research analysis. Psych. Service Center Jour., *3:* Mar.–June 1951, pp. 47–165.
6. Seeman, Julius and Raskin, Nathaniel J.: Research perspectives in client-centered therapy, chapter in Theory and Research in Psychotherapy, by O. H. Mowrer, Ed. New York, Ronald Press 1953.
7. Stephenson, William: Introduction to Q-technique. Unpublished manuscript.
8. Stephenson, William: The significance of Q-technique for the study of personality. Chapter 47 in Feelings and Emotions, M. L. Reymert, Ed. New York, McGraw-Hill, 1950.

SUMMARY OF PAPERS V TO VIII

JOHN ROMANO, *Rochester*[1]

I was asked by our Chairman, Dr. Wortis, to read, study and summarize briefly for you the papers presented in the late morning session. I had limited opportunity to do so as I received three of the papers only a few days ago and had, unfortunately, little time to do them justice. I read the papers of Rado, Ruesch and Rogers with interest and with profit.

I found Rado's paper fresh, precise, but remarkably condensed. After an introductory exposition of his conceptual scheme, he discusses methods of psychotherapy in terms of their component characteristics of programs for priming and programs for modifying. Following this, he reviews vividly and in historical sequence the scientific pedigree of what he calls the adaptational technique of psychoanalytic therapy. In the latter paragraphs of his paper, he considers those inhibitions refractory to treatment because they have been almost completely automatized in childhood and have been continuously reinforced since then. He stated, "We cannot expect to undo these automatizations retroactively by modifying the conditions that had created them." With this, I believe there would be general agreement. He added, however, that in this predicament he has turned to experimentation and tried to divide the inhibited, yet desired performance into steps and to induce the patient to attempt breaking his inhibition step by step. I regretted sincerely that the brevity of the paper did not allow Rado to present at this point the factual data from which he derived concept and method. Perhaps he will have time later this morning to do so and if not, it is hoped he will be able to do so in a later more expanded form of his paper for publication

Ruesch prepared a review entitled, "Social Factors in Therapy". Obviously it was done with painstaking care and industrious scholarship. The paper I read was composed of 52 double-spaced, typewritten pages with 173 references to monographs, reviews and original studies extending back to Lombroso in the 19th century, but reflecting principally current thought and practice in medicine, the social sciences, psychology, psychiatry and psychoanalysis. Structurally the review was divided into "Social Con-

[1] John Romano, M.D., Professor of Psychiatry, University of Rochester School of Medicine and Dentistry, and Psychiatrist in Chief, Strong Memorial and Rochester Municipal Hospitals.

siderations in Psychiatric Thinking" and "Social Considerations in the Practice of Theory". If I am correct after a hasty reading of his review, it is my impression that he has restated and re-emphasized the importance of the concept of the multiple person psychologic field in human biology. In an historical sense, the concept is hardly new, but what appears to be new is the fact that the concept is being introduced into fields in which it was formerly absent, namely medicine, and is being considered not in philosophic or religious terms but is being approached in an exploratory systematic manner. Acknowledging the fact that I am less familiar than Ruesch is with the primary sources of information which he quotes in his paper and subsequently based in great part upon statements presented directly by him in his paper, I am not sure what he means when he says in his concluding statement, "Psychotherapy and psychoanalysis can be completed successfully only when a basic quality of opportunity exists for both the patient and the doctor. For only then can the inequalities of achievement be tolerated. If that is precluded, other means of therapy have to be resorted to." If time permits later, I hope Ruesch will have an opportunity to present to us the nature of the evidence which leads him to this judgment. There is little question in my mind as to the usefulness in general terms of much of the data Ruesch has referred to, namely, the contributions of social psychologists, sociologists, anthropologists and other social scientists, towards a descriptive characterological typology. What I do question are the limits of its usefulness in specific applications to the problems of patients. I draw your attention to Hartmann's statement in a recent exchange with Talcott Parsons concerning the application of psychoanalytic concepts to social science. "Obviously a concept of 'national character' as of character in general should include much more than statements concerning actual behavior; it should—we have a right to expect—tell us about the potentialities of behavior in relevant intrapsychic and outer situations" (1). Although Ruesch cited an earlier reference of Kingsley Davis, I found no quotation in substance concerning Davis' studies on "Mental Hygiene and The Class Structure". I recommended to Ruesch and to others, Davis' studies in which he has made a penetrating analysis of the mental hygiene movement as it addresses itself to parents, teachers and mental hygiene workers. He showed that certain definite, implicit values are shared by all those who conduct training programs in mental hygiene. They label as healthy that type of attitude and behavior which is compatible with the values of the middle class in an open class society with high social mobility upwards, with emphasis on individual freedom of action, unlimited competition, guilt-free acquisition of wealth in the course of this competition and trust in the religious sanction of such behavior (2).

Rogers decided not to present to us any systematic discussion of the

conceptual systems which he uses nor the primarily factual data from which such inferences are drawn. He indicated that he chose to describe the design and method of the research program rather than presenting a report of the results to date of his researches. He holds that "client centered therapy, with its minimal emphasis on manipulation, with the therapist defining his function as primarily that of creating a climate of maximum safety in the relationship and an acceptant understanding of the client's own perceptual field, presents fewer confusing variables for study and it is perhaps because of this that research has already made a significant start in this type of therapy." It would appear to me that Rogers' first conclusion in an assumption to be proved or disproved by the results of experiments such as may be designed by him or by others. He outlines clearly the overall purpose of his program and separates his proposed investigation into four blocks in which certain hypotheses which he believes to be pertinent to therapeutic processes will be tested. The remainder of his paper deals with a description of the experimental design intent on measuring the predictive value of certain tests concerned with the outcome and the process of therapy. Implicit is the assumption that the client's reports are valid sources of information concerning the outcome and process of therapy. Whether or not these tests will provide a means of testing this assumption as well is not clear to me. I regret sincerely, personally, that Rogers did not choose this opportunity to share with this preponderantly medical audience, the nature of the primary data as he observes them from which he derives inference, concept and method.

I did not have any opportunity to read the paper by Rioch and Stanton before coming to the meeting this morning. I listened with interest to the paper as read by Stanton and was highly impressed with the richness of the clinical data which Stanton reported and which has led the authors to make certain inferences and certain practical applications.

REFERENCES

(1) Hartmann, H.: The application of psychoanalytic concepts to social science. Psychoanalyt. Quart., *19:* 385, July, 1950.

(2) Davis, Kingsley: Mental hygiene and the class structure, a study of interpersonal relations, Patrick Mullahy, Ed. Hermitage Press, Inc., New York, 1949.

DISCUSSION

Dr. Henry Walter Brosin [Pittsburgh, Pennsylvania]: I am sure all of us are interested in Dr. Rogers' experimental design. We cannot expect him to give, in the short time allotted, the history of his own development nor the large amount of work that he and his group have done for many years. Neither can we expect him to explain all of the intracacies of the design itself in the work he is now doing.

If time permits, I would like him to speak, if possible, to some of the of the following propositions:

How will he handle the effects of the supportive processes between the patient and the counselor which are more intricate and less available to brief observation?

How he will distinguish between the various levels of reporting during the therapeutic period, at the end and during the follow-up: such factors as the effect of the desire of the patient to please, or the desire to placate the therapist; the flight into health concept, which may cause erroneous reporting; the effects of induced shame or guilt in the therapeutic process?

What are the possible influences of actual manipulation of life situations which may be crucial in the therapeutic alteration of the patient and his concept of self?

These factors must be differentiated from the effects of abreaction, ventilation, gratification of dependent needs, and many others.

I picked this particular cluster of factors because they affect so much the value of the reporting on the T.A.T. and probably even more so on the Stevenson Q technics which have been mentioned.

Dr. Maurice Levine [Cincinnati, Ohio]: My comment will be very brief.

I want to call attention to the fact that there is no representative of the classical psychoanalytic therapeutic approach who is active in the discussion, so that I want to step, let's say, partly out of character for a moment and make the comment that there have been recent advances in psychoanalysis other than those mentioned by Dr. Rado, both with children and adults, and perhaps these recent advances deserve at least some mention in the discussion today.

Dr. Paul H. Hoch [New York, N. Y.]: I should only like to ask Dr. Rado one question. He introduced a new theoretical concept which he called automatized inhibition. I would like him to explain as far as he can with the short time at his disposal how he visualizes the function of this automatized inhibition in a neurotic individual compared to a normal, because if I understand him correctly he believes that this automatized inhibition is a universal phenomenon. Does he believe that this function is qualitatively or quantitatively different in neurotics and what does he call the basic difficulty in a neurotic individual as related to this concept?

Dr. Jurgen Ruesch: Dr. Romano's question about the successful conclusion of therapy and analysis can be answered by saying that it is dependent upon successful communication, and successful communication means the establishment of correspondence of information between the patient and the doctor. All actions are controlled, consciously or unconsciously, by the information which a person or a group possesses. To promote appropriate behavior in individuals or groups, therefore, means to help people acquire a relevant body of information which includes information pertaining to a person's emotions. Only if the information corresponds to the actually occurring events, which fact is mediated by establishing correspondence with the therapist, is the patient in a position to undertake those actions which are relevant to a given social situation.

You have at the present in the world's political scene a most striking example of misunderstanding occurring at the group or national level. Because of differences in basic assumptions of East and West, agreement—that is, correspondence of information—cannot be achieved. Therefore the participant groups undertake action based upon incomplete or erroneous information which, because it does not correspond to the facts, does in turn lead to further misunderstanding.

I presented this paper with the aim to submit to you the idea that in the past human beings have been considered as self-contained entities. Persons were studied in about the same way as an ant was studied in a glass jar. When human beings and social animals are studied in isolation from each other, a serious distortion is introduced. For example, most projective techniques existing in psychology today do not provide within the experiment for data which pertain to the examiner. These tests are often more representative of the bias of the observer than of the interactions which took place between patient and examiner. Whenever people are studied, they are studied by other people in a social context; therefore, it seems to me, we should abstain from thinking about human beings as if they were single isolated entities. We ought to provide in modern theories of human behavior a place for data pertaining to the examiner and to the social context in which observations were made.

Dr. Carl R. Rogers: I should like to say in response to Dr. Romano that I am sorry there was not an opportunity to present the conceptual background of this sort of work. I have tried to present that in written form at various times, and perhaps that will be available to you.

One idea that seemed to run through the comments was that in some way we were relying upon the clients' reports. I must have failed to make myself clear, because none of this research relies directly upon the client's statement of how he feels or what he thinks about his situation. We do get various types of data from the client, and from this data various objective findings can be drawn.

One of the reasons why I said some of the findings were surprising in this one case which I cited is that I had supposed that the phenomenological change, that is, the subjective change as perceived from within, would probably be greater than that which was found when one used entirely outside and objective means of evaluating the individual, as through the T.A.T. In this particular case the reverse was true.

However, if we find that in some instances a client shows a great deal of change in the measures of his subjective perception of himself and no change at all in other objective measures, that would seem to be, then, a flight into health, or a deception of himself. Certainly we would be quite able to detect that sort of thing with the kind of methodology we are using.

I should also like to say that it is very difficult to present a large project in a very brief period of time. Anyone who is really interested in the technical aspects may want to read the three articles that are coming out next month. We have utilized the Psychological Service Center Journal, (1275 New Hampshire Ave. N.W., Washington, D. C.) in which we are able to utilize a whole double issue, about 150 pages, which will describe in much greater detail the design of the research, the techniques used, and give some analysis of the data, particularly in one case. Later publications will, we hope, carry an increasing amount of the primary data which most of the discussants hoped for.

President Wortis: We are grateful to all the speakers this morning, and I trust they will let me have their final manuscripts sometime today.

Section III

CHAPTER IX

AREAS OF RESEARCH IN GROUP PSYCHOTHERAPY

JEROME D. FRANK

INTRODUCTION

Group treatment of psychiatric patients has opened up new vistas for research in human relationships. Small groups of patients meeting repeatedly over many months, discussing their most intimate problems, and reacting to each other in relatively uninhibited ways lend themselves admirably to the study of how people interact and how they change under the impact of their interactions. Research in group therapy is increasing our understanding of group dynamics, that is, the phenomena of group life; human personality as expressed in the characteristic ways a person perceives and deals with others; and psychotherapy, that is, the attempt to modify a patient's attitudes through the influence of another person. The fact that therapeutic groups include other patients as well as the therapist may complicate the therapeutic process but does not basically alter it. In this paper I shall consider primarily areas of research in group psychotherapy relevant to all psychotherapy, and consider the contributions to other fields only from this standpoint.

Research in group therapy offers promising leads in four problem areas: first, classification of patients in a way relevant to psychotherapy; second, the therapist's function; third, the therapeutic process itself, that is, events leading to modification of attitudes; and fourth, evaluation of therapeutic results.

CLASSIFICATION OF PATIENTS

Our scheme of psychiatric diagnosis, even in its latest revision, is of only limited aid in predicting how patients will respond to psychotherapy. Within very wide limits a patient's clinical diagnosis gives little clue as to how he will behave in the therapeutic group, or which of its aspects he will find useful or threatening. This fact, I think, points to the essential weakness in the present scheme: it classifies patients in terms of intrapsychic manifestations which are only loosely and indirectly related to their habitual

ways of dealing with other people, or to the major personal issues which they are trying to work out. If chronic disturbances in interpersonal relationships are seen as both the cause and expression of neurotic illnesses, then the most meaningful classification of such illnesses would be in terms of patients' characteristic ways of relating to others. Such a classification is, of course, very difficult to achieve. Yet study of patients' behavior in therapeutic groups, in conjunction with their performance in interviews and tests, raises the hope that it can be done.

For example, Freedman et al. (1) using data from these sources, have developed a diagnostic scheme in terms of patients' "public", "personal" and "private" levels of functioning. By public functioning is meant how the person behaves, that is, how he affects others. Personal functioning is determined by what he says about himself or others at a conscious level, and private functioning at the unconscious level chiefly by inferences from his performance on projective tests. All three levels can be described by the same scheme of 16 categories representing various combinations of the interpersonal dimensions of dominance-submission and hostility-affiliation. This scheme, incidentally, permits operational definitions of many psychodynamic mechanisms such as projection and reaction formation.

The group psychotherapeutic situation offers another approach to classifying patients in ways useful for psychotherapy which we have been exploring. Instead of starting with a set of dimensions by means of which every patient can be classified we are trying to define patterns of behavior occurring repeatedly in early group meetings which seem consistently related to patients' characteristic ways of dealing with certain personal issues and to their therapeutic course (2). One such pattern, which we have termed that of the "help-rejecting complainer", is characterized by the patient's continually making a play for sympathy and help but rejecting all suggestions that may be offered. Patients showing this group behavior appeared completely self-centered, seemed irritable and tended to arouse contempt or boredom in other group members. Study of their group behavior in conjunction with interview and test data suggested that each was struggling in the same way with the same personal conflict. All seemed to see themselves as unable to solve their own problems and dependent on other people who were unable or unwilling to help them. This pattern of behavior seemed to be an attempt to handle this dilemma by simultaneously asserting their need for help, confirming their belief in the inadequacy or ill-will of the help-giver, avoiding becoming really dependent on him, and justifying their anger at him.

Another group of patients showed a pattern we have termed the "assistant therapist". It was characterized chiefly by the patient's assumption of the role of doctor with respect to the other patients, defense of the

authoritarian viewpoint, and attempt to maintain superiority and to avoid any admission of weakness. These patients all idealized authority in the abstract but perceived any particular authority as falling short of their ideal, which made them resentful towards him. They also felt that they had to impress any authority figure with their loyalty, worthiness and competence in order to win his aid. Their behavior in the group seemed to be an attempt to cope with a dual dilemma arising from these attitudes: how to demonstrate loyalty to an authority whom one resents, and how to indicate a need for help without revealing weakness which, in their eyes, would prevent their getting it.

That such patterns are relevant to psychotherapy is suggested by the fact that help-rejecting complainers presented similar therapeutic problems and ran similar courses, as did the assistant therapists, and the different response to therapy of the two groups was consistent with the differences in personal dynamics suggested by the patterns.

It appears possible that such patterns will prove to bear a systematic relationship to each other, leading to an inclusive scheme of classification. For example, all patients showing these two patterns were preoccupied with problems of dependence on others (an issue which is automatically brought to the fore by any psychotherapeutic situation) but dealt with it in diametrically opposite ways. The help-rejecting complainers were eager to shift responsibility to others but couldn't find anyone they dared depend on. The doctor's assistants fought their dependency and tried to assume full responsibility for handling their own problems. In addition, help-rejecting complainers were relatively insensitive to the attitudes of other group members and readily incurred their scorn; doctor's assistants had to try to impress others at all costs. Thus they seemed to fall on opposite ends of a scale in their attitude towards dependency, and towards peers. Through defining and comparing other patterns, further dimensions may emerge, leading to a framework applicable to all psychiatric patients. Search for additional patterns is continuing.

THE THERAPIST

Next to the patient the most important single factor in psychotherapy is, of course, the therapist. His capacity to help patients depends on many qualities, such as his warmth, wisdom, experience, personality characteristics such as aggressiveness or passivity, his general system of values, and his goals. His technical maneuvers, about which most is written, may actually be of little significance in determining his therapeutic success (3).

In group therapy the effect of the therapist is complicated by the effects of members on each other. Nevertheless, the therapist remains far and away the most influential member of the group, however self-effacing he

may try to be, or however much he may try to make himself into just another group member. He not only affects the members directly but to a considerable extent determines how they affect each other. He is, after all, the only reason for patients being in the group in the first place.

Group therapy facilitates the use of trained observers whose objective scrutiny of therapist and patients permits several approaches to the therapist's effect on the processes of treatment and on different group members (4). At the crudest level it seems profitable to study the differential effects of different group leaders using different approaches on the same patients, though not the same group. For example, in an exploratory study observations were made of a reading-discussion group conducted by an educator with volunteer ambulatory psychiatric patients who were concomitantly in therapy groups, leading to the following observations as to the role of the leader in relation to the purposes and mores of the two types of group and to the responses of the members (5).

Members came to the therapy groups for help and the leader expected to offer help, directly or indirectly. He therefore tried to keep the discussion on personal experiences useful to the group. He might foster unpleasant tensions if he thought that they would bring pathogenic attitudes into relief, and would not dangerously threaten the group's cohesiveness. Emphasis was on expressing, accepting and evaluating feelings. The group mores rewarded bringing up weaknesses and problems and honest expression of feeling, even if this involved socially unacceptable behavior.

The bond between members of the discussion group was not the need for help but interest in ideas. In accordance with this, the discussion group leader tended to shy away from personal experiences except as illustrations of general points and tried to minimize unpleasant tensions. The group mores rewarded intellectual virtuosity and skill in expressing ideas, and behavior of members was expected to be socially proper.

Comparison of behavior of the same patients in therapy and discussion groups clearly showed the differential effects of different types of group leadership on certain patients. For example, one patient in the therapy group spoke of her husband only as an insatiable sexual aggressor for whom she had nothing but scorn. In the discussion group she stressed his relaxed attitude towards life and experimented with alternative ways of perceiving him suggested by the books read, for instance as a successful example of the Zuni mode of life described by Ruth Benedict, or as an example of attitudes advocated by Epictetus.

Another patient, widely read and very articulate but self-conscious with others, and afraid of expressing feelings, found his argumentative skill little appreciated in the therapy group. In the discussion group he gained approval for his real intellectual interest and capacity, and this support

enabled him to behave more naturally and with less tension in the therapy group. In general, the therapy group was more comfortable for patients who were unashamed of their dependency needs, and who were accustomed to react on a primarily emotional plane. The discussion group did not advance the therapy of such patients and might even have increased their uneasiness. It was chiefly valuable for individuals who could gain prestige through skill in handling ideas. Through it they might strengthen their self-esteem to the point where they dared to function more freely in the therapeutic setting. Also, such patients might be led to modify their feelings more easily in an intellectual context than in an emotional one.

Although this study used the same patients in both kinds of group, it did not use the same grouping, and the groups differed in purpose and philosophy as well as in the person of the leader. Group therapy permits study of the differential effects of different therapists on the identical group of patients. Groups readily survive changes in therapist, the members' relationships to each other sustaining them during the transition. We are now studying the same groups, run consecutively by two similarly trained therapists, to determine the effect of differences in their personality attributes or in their perceptions of the patients. A specific problem on which such a study should cast light is the extent to which the experienced therapist offers the same type of relationship to all his patients, regardless of his personal feelings towards them, as Fiedler has implied (6).

PROCESSES OF THERAPY

So far we have considered psychotherapy from the standpoints of the personal characteristics of the patient and the therapist. To complete the picture it must also be studied as a series of interpersonal events, in which the focus is on the events rather than the participants. We have found it fruitful to review records of different groups for recurrent events with apparent significance for therapy. When these were considered in relation to the setting in which they occurred and their apparent consequences, regularities emerged making possible tentative generalizations as to their therapeutic implications (7). These generalizations are, of course, initially and primarily applicable to group rather than individual therapy, but some seem relevant to all psychotherapy. An example of a phenomenon which can occur only in therapeutic groups is the "rallying topic"; that is, a topic chosen by the patients which seems to express a community of feeling and which itself, rather than a patient, becomes the focus of a discussion to which more than two patients contribute. Study of such topics led to the tentative conclusion that they were apt to emerge in a setting in which the therapist had been insufficiently supporting and in which the members, experiencing rising tension, were concerned with feelings towards

each other or the doctor which they could not express. In such a setting, if a patient, or occasionally the therapist, said something which enabled patients to focus on a topic relevant to their immediate feelings (e.g., lack of self-confidence, feelings about being called neurotic, the present group silence) a period of rallying around this topic would ensue which regularly served to reduce the tension and usually led to freer expression of more intimate feelings.

An example of a group phenomenon relevant to individual as well as group therapy is that of expression of hostility towards the doctor. Analyses of situations in several groups in which a member's expression of hostility was followed by patients gaining further insight into their feelings, or conversely by group blocking, made clear that there were two essential factors determining the outcome of such occurrences. These were whether or not other members of the group shared the hostile feelings, and whether the doctor was able to remain secure in the face of the attack and examine it impartially. The doctor's attitude seemed the more important.

Other phenomena lending themselves to this type of analysis were monopolies of the discussion by a single patient, which were helpful in certain defined situations and paralysing in others, expressions of mutual antagonism between patients, and certain situations centering on silent patients and on skeptical ones.

EVALUATION OF PATIENTS' IMPROVEMENT

The question which plagues all researchers in the field of psychotherapy is "How do the results of this particular form of therapy compare with those of other therapies?" This simple query encompasses many knotty problems which cannot be gone into here, of which perhaps the central one is how to evaluate patients' improvement (8). There is general agreement, I think, that one aspect of improvement, however it may be defined, is to be found in the patient's ways of perceiving others and acting towards them. The therapeutic group, as a miniature society, affords an excellent opportunity to observe directly how patients change in these respects under therapy.

A patient's behavior in the group may, of course, be at variance with his behavior in his family or at work, and changes he shows need not parallel those in his daily life. It seems reasonable to assume, however, that a patient's group behavior is at least in some respects a valid sample of his functioning in other aspects of his life, and to this extent study of it helps to evaluate how he has been affected by therapy.

We have become interested in two categories of improvement readily measured in therapeutic groups. These may be termed objectivity and effectiveness. By objectivity is meant absence of distortions or blind spots in the

patient's perception of himself and other people. Using the "Q" technique (9), a patient's view of his own behavior, his view of other patients in the group, and his view of their attitudes to him can all be described in terms of the same framework. A measure of the patient's objectivity is given by the extent of the correspondence between his judgments and those of the therapist and a trained observer, on the assumption that the latter judgments will be nearer the objective truth.

Effectiveness can be defined in part by the influence a patient exerts on the groups to which he belongs, including the therapy group. Through sociometric (10) or "Q" sort techniques we can determine for each patient how doctor, observer and other patients evaluate his influence on the group, and how this changes in the course of therapy. Data obtained by such means can be easily checked by interviews, tests, and interviews with other informants to determine how applicable they are to the patient's functioning outside the therapy group.

CONCLUSION

In concluding this brief survey of possibilities for research offered by group psychotherapy, certain of its limitations should be mentioned. It is not useful for the study of certain psychotherapeutic procedures such as free association or possibly therapeutically significant phenomena such as regression to earliest periods of life because the group situation tends to keep patients in the reality of the present. Since a group is not the place to go deeply into matters of concern to only one member, group therapy does not lend itself to that detailed scrutiny of individual life histories which has added so much to our knowledge of human nature. For study of such problems intensive individual psychotherapy affords a more fruitful field.

Nevertheless, group psychotherapy offers means of dealing with the major unsolved problems responsible for the chaotic state in which the field of psychotherapy finds itself at present. We can emerge from our present confusion only as we become able to state, with increasing precision, what types of therapy will work best for patients with different characteristics. This requires the development of objective descriptions of patients, therapists, and therapeutic processes in terms relevant to psychotherapy, and of standardized measures of improvement applicable to patients undergoing any form of psychotherapy. This paper has attempted to outline some ways in which research in group therapy may contribute to the solution of these basic problems.

REFERENCES

1. Freedman, Mervin B., Leary, Timothy, F., Ossorio, Abel G. and Coffey, Hubert S.: The Interpersonal Dimension of Personality. J. of Personality, *20*, no. 2, 143–161, Dec., 1951.

2. Frank, Jerome D., Ascher, Eduard, Margolin, Joseph B., Nash, Helen T., Stone, Anthony R. and Varon, Edith J.: Behavioral patterns in early meetings of therapeutic groups. Amer. J. Psychiat., *108*, no. 10, 771–778, April 1952.
3. Fiedler, Fred E.: A comparison of therapeutic relationships in psychoanalytic, nondirective, and Adlerian therapy. J. Consult. Psychol., *14:* no. 6, 435–445, 1950.
4. Nash, Helen T. and Stone, Anthony R.: Collaboration of therapist and observer in guiding group psychotherapy. Group Psychotherapy. *4:* nos. 1 & 2, 85–92. Apr.–Aug. 1951.
5. Powell, John Walker, Stone, Anthony R. and Frank, Jerome D.: Group reading and group therapy: A concurrent test. Psychiatry, *15*, no. 1, 33–51, February 1952.
6. Fiedler, Fred E.: *op. cit.*
7. Powdermaker, Florence and Frank, Jerome D.: Group Psychotherapy: Studies in methodology of research and therapy. Harvard University Press, 1952.
8. Miller, James G.: Objective methods of evaluating process and outcome in psychotherapy. Amer. J. Psychiat., *108:* no. 4, 258–263, Oct. 1951.
9. Stephenson, William: A statistical approach to typology, the study of trait universes. J. Clin. Psychol., 26–37, Jan. 1950.
10. Kräupl-Taylor, F.: The pattern of friendliness and dominance in therapeutic groups. J. Ment. Sci., *96:* 407–425, 1950.

CHAPTER X

DYNAMICS AND CLINICAL APPLICATIONS OF GROUP PSYCHOTHERAPY

SAMUEL B. HADDEN

In the time allotted, a complete review of the dynamics of various technics of psychotherapy—for comparison with the dynamics of group psychotherapy—is not possible. However, I feel we can say that the important effective dynamic features of individual psychotherapy are present in group psychotherapy, many in an intensified fashion.

Group psychotherapy for adults and children should be regarded as "action therapy". The action of, and the interaction between, the members of the group provides realistic experience which is not afforded in individual therapy. Catharsis can be direct or vicarious, and shifting transferences to the therapist and members provides a richness of experience in the group which causes us to feel that the most important and unique feature of group psychotherapy is that every individual has the opportunity of re-living in a healthy environment life experiences which earlier were traumatic.

Although in group psychotherapy the group becomes the potent therapeutic instrument, the therapist who handles the instrument, like the surgeon wielding the scalpel, is most important.

In order for members to experience therapeutic re-living in a group, the therapist in addition to being well versed in psychopathology must be tolerant and acceptant of each member, and by a show of interest in each, create in them a feeling of significance. In such an atmosphere the group members will soon accord significance to each other. This ego strengthening experience will not be possible for members of a group if the therapist has a need to exploit them for his own satisfaction. Hence, the therapist himself must be relatively mature so as not to dominate or exploit the group. The mature therapist encourages and enjoys the growth of members toward maturity, equality and liberation. He helps them to feel significant in a society to which they contribute in accordance with their abilities. The good therapist prepares members to function in a democratic society as significant persons—not for life as dependent puppets in a controlled state.

Entrance into a group invariably causes anxiety which I feel can be appropriately likened to the birth anxiety. On entering into the group each patient usually relates himself to the group through the therapist and thereby reduces anxiety. The protection of the parent figure is utilized while each member integrates with the group and becomes accustomed to the new freedom there. New anxieties are aroused by the frank discussions of feelings before the group, but as no reprisals are forthcoming he is soon expressing his own feelings and uncovering repressed material without fear of rebuke or scorn. Although some members try for the therapist's exclusive affection they soon learn that they can be loved without excluding others, and so sibling rivalry situations can be re-lived—happily.

Interpretation—to afford insight—is naturally the principal role of the therapist. When a patient's behavior requires interpretation he should be given first chance to offer explanations of its significance. When other patients interpret, their interpretations are liberally discussed and their validity determined by the group, the involved member and the therapist. The need for interpretation is determined by the therapist in the early phases of group activity but soon patients become adept at interpreting material and sensing resistance. Seldom does the group interpret a member's behavior prematurely, and when a hostile, aggressive member does, the group invariably affords effective protection and support. They intuitively appreciate the need of the weak member's ego defenses.

All familiar forms of resistance are demonstrated in group psychotherapy, often modified for group use. One type of group action interpreted as resistance I feel warrants further examination, i.e., the discussion of the behavior of their children by parents in the group. This form of resistance has special significance which the therapist should recognize and utilize. The discussion of children's behavior arouses anxiety in all members and the discussions of parent-child relations soon lead to recognition of the family romance. The group then re-lives the oedipal conflicts effectively. Incestuous wishes of the past—long repressed—are recalled and re-lived with benefit. In the group parents recall their own repressed feelings of this period as they observe and understand the same behavior in their children. Such understanding invariably makes a better home for the children, and through discussion of the concurrent behavior of children of parents in the group all members work through their own oedipal conflicts.

In plotting the course of discussion in the group no regular course is predetermined but there is a tendency for groups to begin their discussions about feelings of inferiority, after some preliminary sessions devoted to symptoms. Various manifestations and patterns of response to feelings of inferiority are explored and the recognition of them in themselves and others is prompt. Inevitably in the discussion of the genesis of feelings of inferiority the parent role is well examined, and it is only as these discus-

sions proceed that many persons are able to recognize repressed hostile feelings toward their parents. Parental domination and all technics of rejection are exposed and worked through. Invariably at this stage of discussion parents in the group become anxious about their own attitude toward their children and it is about this time that the oedipal situations are discussed and resolved. This is a very significant experience for group patients and usually there is an easing of tension in family constellations as members advance toward maturity.

About the time the oedipal situation is thoroughly discussed and understood, the amount of sexually significant material increases in the group discussion, with deeper and deeper material for interpretation being presented. Conflicts in all stages of sexual adjustment may be recalled and worked through.

The multiplicity of transferences in group psychotherapy necessitates the analysis of many but there is one group transference which is of special interest. In groups composed of patients of the same sex, regardless of the sex of the therapist, the group eventually becomes the parent figure of the same sex, or an idealistic parent figure of the same sex. In the process of working together, the group develops not only a "group mores" but affords members the means of testing the role of their sex realistically. Soon they turn to the group for appraisal and guidance as they would to an effective parent of their sex.

At this stage the therapist, regardless of his sex, seems to be identified as the parent of the opposite sex, and residual hostilities toward that parent may be temporarily diverted to the therapist. The significance of this phase in their development is readily recognized by group members and adjustments are worked out. I have seen patients in a male group reach a decision with a remark "Well, we have spoken", and turning to the therapist ask "How do Mothers feel?"

As a group progresses toward a collectively more mature status there is little doubt that the group assumes the role of a surrogate for society, a society in which each individual feels secure, significant and unafraid to communicate his feelings on any subject—unless the therapist has exploited them for his own emotional needs, in which case they will still be dependent and insecure with residual hostilities. No effect is more noteworthy than the improved communication of group members.

The evaluation of results of group treatment proposes the same difficulty as other forms of psychotherapy. With development of the projective technic better yardsticks are available and coming into more general use. It is safe to say, however, that the therapist's opportunity of observing the patient in the more realistic group setting, as well as the group's collective observations, affords a better method of appraisal of results than is possible in individual therapy.

Since the termination of World War II the increased application of group psychotherapy has placed it in use in almost every conceivable setting. Its efficacy in the psychosomatic disorders has been appreciated by every user since Joseph Pratt (1) began in 1909. His results, verified by the technics of the internist, are enviable even though he professes to know nothing of psychiatric technics. The result obtained by his informative, repressive-inspirational and reassurance technic is weighty testimony to the value of group approach as a potent psychological stimulant to recovery.

In the treatment of the psychoneuroses the group technic has found its greatest favor, but increasing numbers are using the technic in psychotic disorders especially in mental hospitals. From my own experience and that of many others, I believe that its use in the child guidance clinic to help parents to appreciate their role in the lives of their children is one of its most promising areas. When parents of disturbed children are treated in groups, greatest benefit is obtained with the expenditure of least professional time.

Incorporating students in a therapy group for instruction is an excellent way of teaching psychotherapy (2) at both graduate and undergraduate levels. Students having had experience in a therapy group have said that it was an advance which must be similar to the improvement in the teaching of medicine—which occurred when students were taken off the amphitheatre benches, into the wards and operating rooms, to learn medicine and surgery.

By participating in the therapy group the student observes the abnormal behavior of the members, aids in the discovery of the psychopathology, and is a participant in the treatment. He is able to evaluate the efficacy of the process and becomes skilled in its use. It is quite possible that the realistic therapy group will become a substitute for the couch in the training of the psychotherapists of the future.

The action type of therapy used by Slavson (3) with children has become an established technic of great value and, as much as any other group therapy application, attests to the wisdom of the words of Marsh (4): "by the group they have been broken; by the group shall they be healed."

REFERENCES

1. Pratt, Joseph H.: The influence of emotions in the causation and cure of psychoneuroses. Internat. Clin., *4*: 1–16, 1934.
2. Hadden, Samuel B.: Utilization of a therapy group in teaching psychotherapy. Amer. J. Psych., *103*: 5, 644–648, March 1947.
3. Slavson, S. R.: An Introduction to Group Psychotherapy. Commonwealth Fund, Oxford Univ., Press, 1943.
4. Marsh, L. C.: Group therapy and psychiatric clinic. J. Nerv. & Ment. Dis., *82*: 381–393, 1935.

CHAPTER XI

EVALUATION OF THERAPEUTIC RESULTS IN CHILD GUIDANCE PROGRAMS

GEORGE E. GARDNER

In this communication relating to the evaluation of therapeutic results in child guidance programs, I shall direct my remarks to four specific aspects of our work, namely: 1) a general outline of the basic aims of psychotherapy with children; 2) a brief survey of the psychotherapeutic methods most frequently employed at the present time; 3) methods of evaluation of success or failure that can be, and are being, employed to estimate the results of those methods; and 4) the present needs in the child psychiatric field that, if met, would lead to the use of more and better evaluation studies. In each instance, I will suggest how these aspects of psychotherapy and their measurements in our field differ from those that obtain in the field of adult psychiatry.

PSYCHOTHERAPEUTIC AIMS

The child psychiatrist is constantly aware that he is dealing with a growing and developing individual, rather than with a more or less finished psychophysical product. For this reason he is continually confronted (or should be) by the necessity of considering seriously a host of variables referable to fairly wide ranges of normality. There are numberless not too well fixed responses or associated areas of responses that are expected to vary from one chronological age level to the next, that do vary within any given age level and in turn vary again in respect to the sex of the child. It is the acquisition of a working knowledge of these developmental levels and their variations, and of the probable benignity or the relative seriousness of demonstrable retardations or accelerated maturity thrusts in respect to them, that posits the most difficult task for the trainee in child psychiatry. And for trainee and experienced practitioner alike, these developmental variables in the individual case constitute the most serious block in the determination of an accurate diagnosis, the establishment of the therapeutic aim or goal, the selection of the most effective treatment technique to be used, and the evidence of reasonable success in therapy thereafter.

This situation, however, has forced us to adopt one of two aims in therapy with each child patient; and as our knowledge over the years increases, we will probably become much braver in stating at the outset of psychotherapy which of the two aims we will adopt.

1. We can and do aim at the short-term goal of removing the child's present disabling symptom. Such cases are those in which a basic assumption is made that the present disability of the child is (a) of sudden onset; (b) is an extreme defensive maneuver phasic in nature; (c) is referable perhaps to some acute and threatening change in the child's environment of significant people; (d) has not generalized to include a wide range or large number of responses in the child's total behavior repertoire; and (e) finally, the disability, if removed (and it only), will probably allow the child an extremely good chance of continuing thereafter a normal and orderly personality development.

Case categories of this type would be, for example, such disabilities as (a) night terrors; (b) school phobias; (c) partial regression states, in formerly normally developing young children, referable to eating, speaking and toilet habits. In all cases that are selected for therapy aimed at symptom or presenting-disability removal, the initial evaluation of the child must indicate that in the child psychiatrist's best judgment the disability is segmental and particularized and hence the child does not need long-time intensive psychotherapy involving a complete exposure and reconstruction of his concepts of the world about him — notably of human beings in general — or of his concept of himself as a reactor to these human beings.

2. However, in the second place, a definite decision may be reached that only long-time psychotherapy will be of benefit to the child and that a removal of the presenting symptom may delay but not prevent the child from developing a more serious disability later in childhood or in adult life. This decision, too, is arrived at through certain basic assumptions. (a) Usually the condition is long-standing. (b) Its origins presumably relate to deviations in the child's basic concepts of himself and of human beings in general. (c) The disability is generalized in nature in that it is manifested in not one area of living, but ramifies into and alters his behavior in innumerable responses expected at his particular age level. (d) The mere removal of the presenting symptom will not suffice to free the child for orderly development thereafter. His difficulty, in short, is of such a nature and seriousness as to constitute a definite block to future growth.

Case examples of this type are (a) the autistic child; (b) the child exhibiting a markedly deviated psychosexual development; (c) the severe 1) specific or 2) generalized learning block in a child of demonstrated or probable average or superior intelligence.

Naturally there are many other case types that fall in one or the other

of these two groups that I have chosen to demonstrate the selection of children for either long- or short-time psychotherapy. I need not emphasize, either, that the *selection* of cases for short-time therapy is the more difficult decision for the child psychiatrist to make, and the equally more difficult one for him to adhere to with any degree of assurance and contentedness. He is continually haunted by the possibility of the emergence of a new version of a more basic disability at a later date—a disability that symptom removal may not affect at all. Yet we do try to vary our psychotherapeutic aims in the manner cited above.

PSYCHOTHERAPEUTIC METHODS

The treatment methods currently used in child psychotherapy can best be summarized as including the four following steps generally apparent in the order which I will give, though not necessarily so, and with varying emphases on one or more than one phase of therapy by individual therapists or "schools" of therapists. In brief these phases of therapy are seen to be the following:

1. The establishment of a positive relationship between the therapist and child. In children's work, the best in evidence and the most useful relationship is attained when the therapist is sensed by the child to be a warm, nonaggressive, sympathetic and moderately permissive person. I include the phrase "moderately permissive" here inasmuch as extreme permissiveness not only is usually impossible under clinic treatment conditions, but also and mainly because extreme permissiveness easily leads to the activation of guilt feelings in the child and vigorous attempts at withdrawal from treatment.

2. The second phase in treatment concentrates on the exposure of the child's feelings, fantasies and unconscious motivations. As you are aware, we in the children's field, owing to the child's deficiencies in verbalization, must rely heavily upon the projection of these feelings and wishes through the media of writing, drawings, paintings, games and play. Such productions we consider "compromise responses" in that they represent both the expressive and defensive needs of the child in one and the same activity, and the therapist is continually confronted with the task of evaluating the nature and the amount of expression or defense in these responses. He does so with a view to obtaining a consistent continuity of response patterns exhibited by the child in the use of any and all such play material.

3. A third stage in psychotherapy is the gradual confrontation of the child with these exposed patternized responses with varying degrees of interpretation of them in reference to the child's behavior, first in relation to the therapist and later to persons in the child's life beyond the clinic, at home, in school and in the community. I should add that all the problems

under consideration by therapists working in the adult field regarding the most useful types and amounts of confrontation and interpretation—including the timing of the same—are problems currently debated by those of us who work with younger age-groups of patients.

4. Finally, there is a fourth stage in the psychotherapeutic process wherein the child, with the aid of the therapist, attempts beneficial changes in his behavior in the light of the newly acquired knowledge which both have. This is the "trial and error" phase of the process and is not unlike the "trial and error" commented upon extensively in the field of educational psychology. Such devices as advice, suggestion, support and encouragement are brought into play at this time, and actual planning with the child of school and recreational programs is resorted to. I assure you that these are not done in a directive, dictatorial manner, but are in most instances either a sympathetic evaluation with the child of his successes and failures, or they are attempts to extend the rather limited knowledge of the child regarding the environment's total repertoire of people (including other children) and interests in order to satisfy his real needs in a more satisfactory and more acceptable manner.

As I stated above, there are variations in emphases on these four phases of the psychotherapeutic process by the individual child therapists. The widest divergence is apparent perhaps between those who adhere to 1) the genetic psychoanalytic approach and its theoretical constructs—with emphasis on the exposure of the child's past experience and his feelings referable thereto—and 2) the "functionalist school", where emphasis is placed not upon exposure of unconscious impulses, but rather upon the factors involved in the child's presenting problem and the assumed potentials for growth in the child patient from that point forward.

As you know, during the treatment of the child his parents (notably the mother) are in a treatment relationship with another psychiatrist or with a psychiatric social worker. Such a concurrent treatment program may be, in turn, primarily child-centered or mother-centered in its approach; and whichever it is, it is aimed at ultimate benefit to the child and his interparental relationships. From a research point of view, the effects of this treatment add a complicating factor when one attempts to evaluate *only* the effect of psychotherapy with the child. It may eventuate that changes in the mother's attitude and behavior are enough to account for the changes in the child's adjustment or vice versa or both, and hence the selection of definitive causative factors becomes increasingly difficult.

METHODS OF EVALUATION OF PSYCHOTHERAPY WITH CHILDREN

The child psychiatrist has at his disposal various methods for determining and evaluating beneficial changes in the child's behavior and

tangentially—though with varying degrees of certainty—referring them to the effect of the treatment process. We are beset, as are all psychiatrists, with the extreme number of variables at work in a particular case, and we are harassed by the absence of valid controls or of the establishment of acceptable control studies.

However, we do have measurement frames of reference which can be used in our evaluations, some of which are not of equal value to the research worker in the adult field. For example, we have 1) reasonably decent norms of expected physical growth at each age level and 2) objectively determined mental age and IQ levels which admit repetition after selected lengths of time. 3) In addition, we have school grade levels with fairly homogeneous requirements in achievement in different school subjects—with some insights as to the particular mental processes involved in many of these subjects. 4) Available to us also are standardized tests of achievement useful as checks in both directions, i.e., as to behavioral accomplishments or changes in them and also as to the use of or the inability to use the intellectual potentialities already cited for us by the tests of intelligence. 5) We have, too, the projective techniques that give us a rough estimate of the child's "emotional age", his "ego strength", and his identifications which are to us of significance in respect to his psychosexual development, and his concepts of himself and others. 6) Finally, of course, we have observable and more presumptive—though not measurable—evidence of the effects of psychotherapy through changes in the child's interpersonal relationships—and these in different child-life situations.

Through the use of any one or a number of these practical "norms" or "ranges", the child psychiatrist is in a position to establish some reasonable checks upon the effect of his work. In the main these studies involve: 1) the evidence of the removal of the symptom or the presenting disability; 2) follow-up studies of the child months or years following the treatment sessions; and 3) case studies.

1. (a) The removal of a symptom is, at best, presumptive evidence of the effects of psychotherapy with children and is a more tenable presumption if its relatedness in time and in insights gained to the actual work with, and productions of, the child is established. The disappearance of sleep disturbances and the resumption of day-by-day attendance at school of the previously school-phobic child can in many instances be related to a particular therapeutic session or to a circumscribed set of sessions with the therapist. (I should add parenthetically that actually the recovery figures with children suffering from these two disabilities who come to therapy and the evidence of relatedness of this recovery to the psychotherapeutic process are very good.)

(b) The check of the relatedness of the effect of psychotherapy upon

specialized learning disabilities or generalized learning blocks is much less easy to establish. It is not that we do not have fairly accurate evidence when such symptom-recovery is apparent, because we do, in the form of the numerous test results which I commented upon above. And though no other discernible factor of sufficient weight, other than psychotherapy, may seem to us to have entered the picture and altered the child's attitude toward—or success in—learning, we are still unable to conscientiously ascribe it to psychotherapy because of the present-day inadequacy of our knowledge of the learning process itself, and particularly of the nature and varying effects of the child's emotional adjustment in respect to that process. Additional and better-designed basic research and particularly the selection of control groups of untreated cases in these areas are needed in both the university and the clinic before accurate evaluation studies can be made.

2. Longitudinal studies both in respect to the earliest causative factors in symptom formation and in respect to the child's adjustment months or years following psychotherapy have always been the favorite design in all aspects of research with children. In the field of juvenile delinquency, the studies of the factors favoring emergence, the predictability and recidivism in antisocial behavior in the publications of William Healy, Sheldon and Eleanor Glueck, Edwin Powers and many others are outstanding. Dr. Healy's follow-up study of 400 cases of juvenile delinquency was the most notable attempt to establish presumptive evidence that the psychotherapeutic process did have something to do with the absence of recidivism in 80 per cent of the cases treated. However, as is well known, all such attempts at follow-up criteria are harassed by the absence of demonstrable relatedness of the "therapy cause" and the "beneficial behavior result" and the extremely large number of variables that inevitably enter to significantly change the child's behavior.

3. Extremely worth-while case studies of long, intensive psychotherapy with individual patients exhibiting a particular disability are still the important research contributions being made in the field of child psychiatry, and notably in child analysis. Most of these refer directly and in detail to the psychotherapeutic techniques used at various stages in therapy, and to the immediate subsequent changes in the behavior of the child that are acceptable, as due to the therapy. The most notable contributions of this type at the present time are those of Berta Bornstein, Beata Rank, Bettelheim, Melitta Sperling, Redl and Szurek. These case studies do, in detailed and sometimes dramatic form, give evaluations of success or failure in child psychotherapy. Follow-up studies some years hence will be of great value to us in that they should indicate the ultimate lasting or temporary effects of their work.

RESEARCH NEEDS IN THE FIELD OF CHILD PSYCHIATRY

I will conclude by pointing out a few of the research needs in the field of child psychiatry that must be met before we will be able to assess, in an acceptable fashion, the results of psychotherapy with children.

1. The first and foremost need of child psychiatric clinics, as far as research is concerned, is the need for more people with an aptitude and training in research. At the present time most of our clinics are service- and training-oriented, and much less research-oriented than they should be. Much of our research is still that which is the product of evening, week-end and vacation-period labor, or clinic-hour labor that is by decree allotted not to research, but to therapy or to training programs. We desperately need more research departments headed by research directors who not only can do creditable original work themselves, but who also can guide and direct the research activities of other members of the staff who show an initial competence in this area. Needless to say, the ideal research director whom we need is one who has—and will continue to have—a genuine interest in and a passable competence in psychotherapy.

2. In child psychiatry research, we need particularly some sort of two-way bridge (presumably in the form of personnel) between the clinic and the research departments of the university in the fields of (a) child development, (b) educational and clinical psychology, (c) sociology and anthropology. As a matter of fact, our biggest difficulty in programming research studies in our field is the determination of just what type of studies—well-designed studies acceptable by university standards—our present-day clinical materials will allow. We just do not know except in a rather vague way whether the data which we have selected are meaningful when the application of research methods is desired.

Hence it seems to me that if these two major needs were once met—in the matter of trained personnel and the alliance with research departments in the fields of child development and social relations—we would then set about to acquire: 1) better norms of physical, social, educational and emotional development; 2) a better orientation toward—and exactness in—diagnosis; 3) a more valuable selection of and recording of our clinical data; and 4) the formulation of acceptable control cases and groups of control cases.

These needs seem to me to be our present pressing needs in the field of child psychiatry, and when they are met—as I hope they will be—we will then be able to appraise more accurately the results of psychotherapy with children.

CHAPTER XII

EVALUATING THERAPY IN A DELINQUENCY PREVENTION PROGRAM

HANS-LUKAS TEUBER AND EDWIN POWERS

This is a report on work done during our association with a unique social experiment: the Cambridge-Somerville Youth Study, originally conceived and endowed by the late Dr. Richard C. Cabot (24). For approximately eight years, from 1937 to 1945, this large-scale treatment effort was directed at the prevention of delinquency, by guidance, counseling, and therapy, in a group of several hundred underprivileged boys. The uniqueness of the Study, however, did not so much lie in the scope of its treatment efforts, nor in the outcome, as in its avowed purpose to serve the ends of evaluative research.

By setting up a control group, and by keeping unusually detailed records, the Study made provisions for quantitative measurement of the effects of therapy, and for systematic attempts at an objective description of the therapeutic relationships. Probably the most outstanding feature of the program, as envisaged by Cabot, was the existence of an untreated control group, whose members had been matched individually, at the outset, with the members of the treatment group. As far as we can ascertain, the only study of therapy which approximates such controlled experimentation has been Denker's survey (5). The results of the Cambridge-Somerville Youth Study, as you shall hear, have not been too different from those reported by Denker.

PROCEDURES

As in any ordinary instance of experimental therapeutics, the basic design of the Cambridge Study was simple. The program began with the selection of subjects from the underprivileged areas of Cambridge and Somerville (Massachusetts). The names of the boys, between six and ten, and rated as likely to become delinquent, were solicited from school teachers, policemen "on the beat", and settlement workers. A smaller number of boys without any apparent delinquent tendencies was also included. A list of 650 boys was obtained, and these boys were individually matched, in pairs, according to a large number of variables; such as age, intelligence

quotient, school grade, delinquency rating, ethnic and socio-economic background, and other factors. The decision which boy in each pair should be treated was made by the toss of a coin. By this matching process the original group of 650 was split into two equal groups of 325: a treatment group (T) and a control group (C).

As soon as a boy had been selected and matched, he was assigned to one of the original ten counselors employed by the Study, and "treatment" was initiated. Treatment activities ranged from a friendly relationship of the big-brother variety to increasingly formal therapeutic interviews according to principles of psychiatric social work. With the turnover in the treatment staff enforced by World War II, and the employment of an analytically trained treatment supervisor, the Study's approach became gradually more similar to that of other, more orthodox guidance centers. To the end of the treatment period, however, there remained some of the original emphasis on directed "friendship" as a means of delinquency prevention, and the staff's attitudes seemed clearly divided between apostles of "friendship", and those of professional counseling.

Regardless of the individual counselor's predilection, all treatment consisted of individual, face-to-face contacts. These individual relationships between counselors and boys thus served as the independent variable: they represented "treatment" as originally planned by Cabot; they were restricted to the treatment group and consistently withheld from the control group. By the end of the treatment period, in 1945, one of us (E. P.) compared treatment and control groups with regard to the number of offenses committed, and three years later a similar statistical comparison was made. Treatment, by 1945, had lasted for 2 to 8 years in individual cases, with a median duration of 4 years and 2 months.

EVALUATING OUTCOME

The total number of court appearances from the beginning of treatment to July 1, 1948, for the T and C groups, respectively, was

	T	C
Number of boys	96	92
Number of offenses	264	218

A similar picture is given by the number of appearances before the Crime Prevention Bureau, from 1938 to 1946, inclusive:

	T	C
One time	49	49
Two or three times	65	52
Total	114	101

Such an outcome of the delinquency prevention program of the Study appears to be not only negative, but paradoxical. Instead of confirming the expectation that the treatment group would be less delinquent than the matched control group, there is a slight difference in favor of the control group. This apparent advantage of the control group may be offset, however, by other factors which more detailed statistics seem to reveal. There is a slightly greater incidence of serious recidivism (if defined as three or more offenses per boy) in the control group, and a rating of all offenses according to "seriousness" likewise shows a slight advantage of the treatment cases over the controls: there is a tendency on the part of the controls to commit a proportionately greater number of the more serious offenses.

None of these trends, however, are as yet significant. Unless further developments change the picture (as they well might) the direct comparison between T and C groups fails to show that the major hypothesis can be sustained: treatment did not, so far, reduce the incidence of adjudged delinquency in the treatment group.

We think this outcome is especially revealing in view of the rather different expectations of the counselors themselves. They believed that the Study's program had "substantially benefited" about two-thirds of the boys whom the Study served. Moreover, slightly more than half of the boys, when interviewed systematically after the close of the treatment period, volunteered that they had been helped by their association with the Study.

These findings illustrate the importance of the control group, and the peculiar difficulty one has in interpreting the counselor's (or the counselee's) "own story" unless objective behavioral indices for treatment success are available. Quantitative indices of behavior, of course, are not infallible; and evaluation in terms of court appearances might suggest some of the crudity of market research. Yet, quantitative indices, where available, are better than professions of faith bolstered by the therapist's prestige and the skillfull use of the illustrative case.

EVALUATING RELATIONSHIPS BETWEEN COUNSELORS AND BOYS

A control group design is indispensable as a basis for demonstrating tangible results of treatment; but it does not yield any definition of the independent variable: the treatment process itself (12). The task of analyzing the treatment relationships fell to one of us (H. L. T.) at the suggestion of Gordon W. Allport, the Study's principal scientific advisor.

The traditional approach to analysis of therapy has been the psychiatric case study: an historical and interpretative commentary on the therapist's activities, as recalled by the therapist himself at the time of recording. As a form of historiography, the case study is the more persuasive the

greater the artistic skill of its author (1, 13). As a source for an objective analysis of what happened in the course of the therapeutic relationship, however, the therapist's report should be supplemented by complete phonographic records and other objective material, a practice convincingly advocated by Carl Rogers and his school (4, 27, 28, 34).

In the Cambridge-Somerville Youth Study, completely transcribed interviews came into use only after the end of the formal treatment period, that is after 1945. The available sources for analyzing the relationships between counselors and boys were, as usual, the counselor's own records, kept in the form of (often daily) logs of the treatment process. By 1945, these records of interviews, visits and similar activities had grown into an aggregate of 22,000 single-spaced typewritten pages, referring to individual interaction between 19 counselors and a varying number of boys (325 in 1939, and 75 by the end of treatment, in 1945). Such massive evidence would seem sufficient to discourage even the hardiest social scientist, if called upon to analyze treatment relationships and to relate this analysis to the total outcome of the Study.

What is more, these records, despite their bulk, were incomplete: they presented only the counselors' side of the picture. As a description of the relationship between counselor and boy, the counselor's "own story" was inadequate. Rather than follow the usual method of accepting the therapist's view, we proceeded therefore as if faced with the task of a cultural anthropologist: that of describing a social system different from one's own (3, 25, 39). As in anthropological field work—and we hope, without malice—we consistently made a distinction between what the partners did, and what they said they did (14, 15, 18). We further compared what A said about B (the counselor's account of the boy's relationship with the counselor), with what B said about A (the boy's account of the counselor's relationship with the boy) (16, 35, 36).

Data were accordingly gathered, both during and after the treatment period, concerning 1) the counselors' conceptions of the relationship ascertained by means of questionnaires, rating scales, and focused interviews; 2) the boys' conceptions of the relationship ascertained primarily by means of focused interviews with 135 boys, and by modified sociometric procedures (17, 19, 22); 3) the facts pertaining to the counseling relationship as far as they could be ascertained independently of the partners' interpretations, including a record of frequency of face-to-face meetings, place of meetings, and types of joint activities.

The results of these surveys have been described elsewhere (37); they do not lend themselves readily to any summary presentation. It turned out, for instance, that counselors differed consistently in the articulation or stereotypy of their relationships; in the degree of accuracy with which they

estimated the boy's reaction to themselves (the counselors); and in their ability in maintaining strong relationships (high "rapport") with many boys or with few. The principal features of the analysis, however, can be characterised; they were determined by the conceptual scheme which we adopted for the purpose of interpreting our data.

First of all, the counselor-counselee relationship was considered as a miniature social system (9, 20, 21): a group consisting of two participants (dyad) (10, 11, 32, 33, 41). Analysis of social interaction in such dyadic groups is notoriously difficult, since sociological concepts are ordinarily applicable only to larger systems, and psychology deals either with the individual, or with the individual and the group, but rarely with groups consisting of only two participants. The dyad as a problem for social science thus falls into the gap between psychology and sociology, and the difficulties of communicating about the psychiatric treatment process, between adherents of different schools of therapy, will not be overcome until we have a descriptive scheme which can be applied to all types of therapy. Given a formal conceptual scheme we can communicate about miniature social systems, such as dyads, and we can describe the therapeutic process in terms that are both quantifiable and neutral with regard to therapeutic doctrines.

Considered as minimal social systems, or dyadic groups, the individual counseling relationships could be ordered along a number of dimensions. Dyads, we concluded, could be classified to the extent to which they appeared to be "generic" or "unique", i.e., the extent to which the partners considered each other as replaceable or irreplaceable in their relationship (33). Dyadic groups could further be classified into "embedded" and "isolated" dyads—according to the extent to which the partners were able or unable to maintain their relationships within a matrix of other social relations. (Such distinctions may appear unnecessarily formal and theoretical, but their value lies, we repeat, in their universal applicability (20, 21, 38, 39, 41).)

In the setting of the counseling program "dyads" could be classified finally as "parataxic" or "integrated", according to the extent to which the partners failed or succeeded in grasping each other's conception of their relationship. For the concept of parataxis we are indebted to H. S. Sullivan (35, 36).

Of particular interest were occasional instances of marked discrepancy in the partners' interpretations of their relationship. While a counselor might describe a boy's attitude toward him as affectionate, or depending and trusting, the boy might assert that the counselor functioned as a detective, or a hostile social investigator. Such discrepant interpretations, if persistent, were considered as indicative of parataxis.

Parataxis was found to be either unilateral or bilateral. If unilateral, A "misinterpreted" the attitude of B toward himself (A), but not vice versa. In bilateral parataxis, A misjudged B's attitude toward A, and B misjudged A's attitude toward B. Longitudinal analysis of a stratified sample of 65 counselor-boy relationships suggested that relationships that had become parataxic did so almost from the start, and that the partners' misinterpretations, in this setting, were surprisingly persistent. Seemingly sudden shifts towards hostility in the counseling dyads frequently could be traced back to initial inadequacies in the partners' conceptions of the relationship.

Although outright parataxis seemed to appear in only about one third of the counselor-boy relationships analysed, their possible relation to failures of "treatment" prompted further studies of those counselors who were high in parataxis as against those (the majority) whose counseling relationships appeared to be predominately integrated (non-parataxic). Following the example of earlier studies by Frenkel-Brunswik (6) and by Sears (29, 30, 31), all counselors were asked to rate each other, as well as themselves, on a number of scales referring to personality traits and to professional competence. By analysing the ratings one could discover the extent to which counselors departed in their self-ratings from the pooled ratings given to them by their colleagues. We could furthermore quantify the extent to which a counselor agreed, in rating his colleagues, with the pooled ratings given them by the staff as a whole.

From these analyses it appeared that counselors with frequent parataxis exhibited a number of related tendencies: 1) they patterned the descriptions of their relationships with excessive uniformity; 2) they were poor judges of themselves, 3) although not necessarily poor judges of others, they tended to judge by projection; 4) they considered their counseling relations as a highly effective tool in producing changes in their charges. All these tendencies can be considered as instances of lack of articulation in social perception (7, 8, 40). Counselors with integrated dyads tended toward high degrees of articulation; counselors with parataxic dyads toward low degrees of articulation.

Parataxis was discovered by comparing the counselors' accounts of their relationships with the boys' "own story" (interviews with boys). Transcripts of these interviews held by members of the research staff with the boys, were submitted to four judges who rated each interview with respect to "rapport" and "perspective" manifested in the boy's account of his relationship with his counselor. "Rapport" was defined as the value which a boy seemed to attach to the relationship with his counselor. "Perspective" denoted the boy's apparent insight into the purpose of the relationship. The ratings on rapport were validated by an order-of-preference procedure

in which the boys ranked their counselors on the same scale as their friends and associates. A further check on the validity of the ratings was made by counting the frequency of a boy's spontaneous visits to his counselor.

Contrary to the belief of counselors who stressed the professional aspects of their relationships, rapport and perspective turned out to be higher among the adherents of "friendship". In cases of low rapport, the counselors were found to misjudge the situation by overestimating their success in achieving rapport. But generally, a counselor's estimate of a boy's liking for him was less valid, as an indication of "true" rapport (judges' ratings), than the counselor's rating of his own liking for the boy.

Analysis of additional sources of information on counselors and boys revealed that, on the part of the counselors, ability to maintain rapport was unrelated to the amount and kind of professional training. On the boys' part, there was evidence for a particular "friendship proneness": boys who had many friends and who preferred contemporary playmates, responded better to their counselors than those who had few friends or were rejected at home. Boys who had been adjudged delinquent by the courts responded better than "unofficial" delinquents. Rapport and perspective were highest wherever the boy himself took the initiative, and wherever a definite goal common to counselor and boy was adopted.

The usefulness of these descriptions of the counseling process would have been greater, if the outcome had revealed differences between treatment and control groups. In the absence of such differences, the descriptions retain some value: they represent the trial application of a conceptual scheme which might be found useful in other settings were therapeutic relationships are to be described.

We insist particularly on our conclusion that an adequate empirical description of minimal social groups (such as therapeutic dyads) cannot be accomplished by relying exclusively on, either, the partners' conceptions of the relationship, or on the conception of the relationship held by outside observers; both are necessary sources of data. Further experimental studies of the effects of therapy should consider the potential usefulness of such a formal approach to their material, in which sociological theory and anthropological field work methods are combined into a framework of universal applicability.

DISCUSSION

The results of the Cambridge-Somerville Youth Study, as presented thus far, are neither final nor unequivocal. Gordon Allport (2) in particular, has stressed that future surveys comparing T and C groups might reveal a gradual unmatching of the two groups, in the direction of an increasing tendency to law-abiding behavior among the "Ts". Such an instance of

"delayed" results is not precluded by the data now available. Nor can we extend our conclusions beyond the unique features of the Study and assert that delinquency prevention, in general, is impossible. Conceivably, a program using different methods, or merely operating in a different setting, might have greater or more immediate results. But all this is not the point at issue. We believe that the Study should rather be considered as a paradigm for research in the effects of therapy.

Before the data derived from the control group had become known, all but two members of the treatment staff predicted significant success. An evaluation in the usual style, based on the counselor's own story, and devoid of objective indices of altered behavior would have resulted in merely another report on eminently successful therapy (23).

In fact, one of the most remarkable features of the Study was this willingness, on the therapists' part, to submit their work to the scrutiny of an independent research staff, whose functions could have easily been misinterpreted as those of efficiency experts or company spies (26). To be sure, some frictions did arise, but they were overcome through the joint effort of the treatment and research staff. An analysis of those tensions that did develop from time to time is instructive, since similar difficulties are likely to appear in other agencies in which treatment and research staff members have to interact.

To some of the counselors, the whole control group idea, and our insistence on an objective description of the counseling process, seemed slightly blasphemous, as if we were attempting a statistical test of the efficacy of prayer. Theirs was an "ethics of sentiments" rather than an "ethics of consequences" (39). They insisted that the relationships established had their value in themselves, irrespective of their possible effect on the boys' behavior, and they were not perturbed when the seemingly negative results of the delinquency prevention program became known. Other counselors reacted differently; they felt that research was superfluous, since all the necessary rules of conduct in therapy were already known. When they were informed of the outcome of the Study, they reacted in a characteristic fashion: those who were analytically trained and oriented asserted that the results would have been positive, had analytic principles been applied by all staff members, consistently, throughout the course of the treatment period. Conversely, those counselors, who were followers of Carl Rogers' non-directive approach averred that a systematic use of non-directive methods would have produced more definite success.

Patently, our data do not bear on any of these questions. The varied and eclectic approach to treatment in the Study precluded a fair test of any specific form of therapy. We submit, however, that the data yield one definite conclusion: that the burden of proof is on anyone who claims

specific results for a given form of therapy. It is admittedly difficult to provide for expensive control settings similar to that of the Cambridge-Somerville Youth Study. But the objective evaluation of therapeutic processes is of such importance that similar studies, in many areas of therapy, are indicated.

REFERENCES

1. ALLPORT, G. W.: The Use of Personal Documents in Psychological Science. New York, Social Science Research Council, Bull. 49, 1942.
2. ALLPORT, G. W.: Foreword to: POWERS, E. AND WITMER, H.: An Experiment in the Prevention of Delinquency, pp. v–xxx. New York, Columbia University Press, 1951.
3. BATESON, G.: Naven: a Survey of the Problems Suggested by a Composite Picture of a New Guinea Tribe Drawn from Three Points of View. Cambridge, Cambridge University Press, 1936.
4. COVNER, B. J.: Studies in phonographic recording of verbal material. III. The completeness and accuracy of counseling interview reports. J. gen. Psychol., *30:* 181–203, 1944.
5. DENKER, P. G.: Results of treatment of psychoneuroses by the general practitioner: a follow-up study of 500 cases. N. Y. State J. Med., *46:* 2164–2166, 1946.
6. FRENKEL-BRUNSWIK, ELSE: Mechanisms of self-deception. J. soc. Psychol., *10:* 509–520, 1939.
7. HEIDER, F.: Social perception and phenomenal causality. Psychol. Rev., *51:* 358–374, 1944.
8. HEIDER, F.: Attitudes and cognitive organization. J. Psychol., *21:* 107–112, 1946.
9. HENDERSON, L. J.: Physician and patient as a social system. New Engld. J. Med., *212* (18): 819–823, 1935.
10. HENNING, H.: Der Mehrpersonen- und Partnerversuch. Bericht ueber den 10. Kongress fuer experimentelle Psychologie in Bonn, 1927.
11. HENNING, H.: Ziele und Moeglichkeiten der experimentellen Charakterpruefung. Jb. Charakterol., *6:* 213–274, 1929.
12. HUNT, J. MCV.: A program of research in psychotherapy. Presidential address, Division of Personality and Social Psychology, American Psychological Association, Chicago, Illinois, September 1, 1951.
13. KLUCKHOHN, C.: The personal document in anthropological science. In L. GOTTSCHALK ET AL. (eds.): The Use of Personal Documents in History, Anthropology, and Sociology. New York, Social Science Research Council, Bull. 53, 1945.
14. KLUCKHOHN, C.: Patterning as exemplified in Navajo culture. In: SPIER, L. (Ed.): Language, Culture, and Personality. Menasha, Wisconsin, Sapir Memorial Publication Fund, 1941.
15. LASSWELL, H. D.: A provisional classification of symbol data. Psychiatry, *1:* 197–204, 1938.
16. MEAD, G. H.: Mind, Self, and Society from the Standpoint of a Social Behaviorist. Chicago, University of Chicago Press, 1934.
17. MORENO, J. L.: Who Shall Survive? Washington, Nervous and Mental Disease Publishing Co., 1934.
18. MORRIS, C. M.: Foundations of the theory of signs. Int. Encycl. Unif. Sci., *1:* 2. Chicago, Univ. of Chicago Press, 1938.
19. NORTHWAY, MARY L.: A method for depicting social relationships obtained by sociometric testing. Sociometry, *3:* 144–150, 1940.
20. PARSONS, T.: The Structure of Social Action. New York, London, McGraw-Hill, 1937.
21. PARSONS, T. AND SHILS, E. A. (Eds.): Toward a General Theory of Action. Cambridge, Mass., Harvard University Press, 1951.

22. POTASHIN, REVA: A sociometric study of children's friendships. Sociometry, *9:* 48–70, 1946.

23. POWERS, E.: An experiment in prevention of delinquency. Annals Amer. Acad. Pol. Soc. Sci., *261:* 77–88, 1949.

24. POWERS, E. AND WITMER, HELEN: An Experiment in the Prevention of Delinquency: The Cambridge-Somerville Youth Study, pp. xliii and 649. New York, Columbia Univ. Press, 1951.

25. RADCLIFFE-BROWN, A. R.: The Andaman Islanders: a Study in Social Anthropology. Cambridge, Cambridge Univ. Press, 1922.

26. ROETHLISBERGER, F. AND DICKSON, W. J.: Management and the Worker. Cambridge, Harvard Univ. Press. 1943 (6th printing).

27. ROGERS, C. R.: Counseling and Psychotherapy. New York, Houghton, Mifflin & Co. 1942.

28. ROGERS, C. R.: Significant aspects of client-centered therapy. Amer. Psychologist, *1:* 415–422, 1946.

29. SEARS, R. R.: Experimental studies of projection. I. Attribution of traits. J. soc. Psychol., *7:* 151–163, 1936.

30. SEARS, R. R.: Experimental studies of projection. II. Ideas of reference. J. soc. Psychol., *8:* 389–400, 1937.

31. SEARS, R. R.: Survey of Objective Studies of Psychoanalytic Concepts. New York, Social Science Research Council, Bull. 51, 1943.

32. SIGHELE, SCIPIO: Le crime à deux: essai de psychologie morbide. Paris, F. Alcan, 1893.

33. SIMMEL, G.: Soziologie; Untersuchungen ueber die Formen der Vergesellschaftung, 3rd Ed. München and Leipzig: Duncker and Humblot, 1923. Partly translated in: The Sociology of Georg Simmel, Ed. by Kurt H. Wolff. Glencoe, Illinois, Free Press, 1950.

34. SNYDER, W. U.: An investigation of the nature of nondirective psychotherapy. J. gen. Psychol., *33:* 193–223, 1945.

35. SULLIVAN, H. S.: A note on the implications of psychiatry and the study of interpersonal relations for investigation in the social sciences. Amer. J. Sociol., *42:* 848–861, 1937.

36. SULLIVAN, H. S.: Psychiatry: Introduction to the study of interpersonal relations. Psychiatry, *1:* 121–134, 1938.

37. TEUBER, H. L.: The Dyadic Group: A Study in Counseling Relationships, pp. iv and 549, Ph.D. Thesis, 1947, Harvard University. Widener Library, Harvard University, Cambridge, Massachusetts.

38. TÖNNIES, F.: Fundamental Concepts of Sociology (Gemeinschaft und Gesellschaft). Transl. and supplemented by C. P. LOOMIS. New York, Cincinnati, American Book Co., 1940.

39. WEBER, M.: The Theory of Social and Economic Organization. (Translated by A. M. HENDERSON AND T. PARSONS). New York, Oxford University Press, 1947.

40. WERTHEIMER, M.: Laws of organization in perceptual forms, pp. 71–88 in: A source book of Gestalt psychology (W. D. Ellis, Ed.). New York, Harcourt, Brace & Co., 1939.

41. WIESE, L. VON: Systematic Sociology, on the basis of the Beziehungslehre and Gebildelehre of Leopold von Wiese, adapted and amplified by HOWARD BECKER. New York, J. Wiley & Sons, 1932.

SUMMARY OF PAPERS IX TO XII

DAVID M. LEVY, *New York*

This is a large series of very interesting papers, somewhat diverse. Dr. Frank's and Dr. Hadden's are in the same sphere.

It is interesting that Dr. Frank, who has had a wide experience and also a definitely investigative point of view over the years in group psychotherapy, has brought forth a series of really new questions. He has shown an awareness of the intricacies of relationships in group therapy of the kind described earlier today by Dr. Stanton. It is interesting that with growing knowledge of the field, what is coming out now is the question of what kinds of investition are most useful.

I am taking advantage of the experience of another investigator of group therapies, Dr. Bion of the Tavistock Clinic, to put this statement to Dr. Frank for his reaction:

"Since the objective of the group type of therapy is to develop the capacity of its members for cooperative work, to stress individual relationships is to defeat the purpose of the procedure." (Experience in Groups, VI, Human Relations, *3:* 395–402, 1950.)

Dr. Hadden has given us a number of clinical inferences that constitute what we think of as clinical wisdom. That is the stage that precedes the systematic accumulation of data, and there is nowadays the danger that one does not stay in that stage long enough, since the pressure for research comes too soon. The clinical stage is the incubation stage, and in group research particularly, that stage is still desirable for a long time.

I should also like to ask Dr. Hadden to respond to one of the points made by Dr. Bion in his long experience with groups. He said, that all groups, regardless of the type of psychotherapy employed, tend to thaw out. When this process occurs (that is, this process of group cohesion, which is not in itself necessarily therapeutic), it acts, whenever it occurs, as the greatest resistance to the psychotherapist. That is, the group has thawed out sufficiently to regard the psychotherapist, in a way, as a common enemy.

Dr. Gardner's systematic presentation of the field of child psychiatry was of great interest and, I think, amounts to the following bits of knowledge:

1. Do no more than appears to be necessary.
2. In the process, you will need a variety of tools. You will be handicapped by limiting yourself to any one kind of instrument.

We all share with him his hopes for research and the statement of the need of giving exclusive research time within this field and not making it something stolen from one's clinical work or one's necessary vacation time.

One of the findings that resulted from a series of follow-up studies, starting at the Institute for Child Guidance in New York and utilizing the material from about a dozen child guidance clinics, to which I hope Dr. Gardner will respond, was that the highest correlation with general personality growth was the disappearance of the presenting symptoms. That would be a very important finding if substantiated—that when the so-called symptoms have been removed, follow-up studies reveal that concurrently beneficial inner changes have taken place.

Dr. Teuber has presented a most comprehensive, careful, well-controlled research in a field most difficult of study. I don't think his results are surprising, namely, that psychotherapy is not in itself effective in the field of delinquency when the situation is not otherwise controlled. But what is surprising is his finding that regardless of the kind of relationship that existed between counselor and patient, it made no difference in regard to the therapy.

I am tempted to ask him what hunches he has as a result of this massive undertaking, his clinical inferences that at present go beyond a statistical formulation.

DISCUSSION

Dr. Jerome D. Frank: It seems to me that that statement of Dr. Bion's is only partly true—that since we are trying to help the patient to work more cooperatively we must not work with his individual relationships. It is true certainly that in group therapy we have always to keep in mind the group relationships and the patient's individual relationships in reference to the total group situation. But after all, in individual therapy, too, we try to increase a patient's capacity for cooperative work, and we do that through freeing him from the things that prevent his working cooperatively by a close analysis of his relationships to one individual.

Dr. Samuel B. Hadden: If by the term "thaw out" you mean the friendly familiarity that so frequently characterizes the cocktail party, I assure you that in a therapy group it constitutes a very difficult form of resistance. When group members regard the sessions as very sociable "get-togethers" of a group of pleasant, understanding people, little therapeutic progress will be made.

Dr. George E. Gardner: In reply to Dr. Levy's statement that in the Institute's studies they noted a high correlation between the symptoms' removal and concomitant general personality growth, I would say that we have also noted the same correlation in many of our cases of marked educational block due to emotional factors. We have a number of these children at the present time where with a relief of the symptoms there was an increase of 20 points in the I.Q.'s. There is also an ability on their part to regain that grade level which they would have obtained had they not been victims of the disability with which they presented themselves at the clinic. Finally, there is an elimination, in many cases, of the antisocial behavior or the extreme types of withdrawal which they manifested.

DR. HANS-LUKAS TEUBER: I am afraid I have no direct reply to Dr. Levy's query. I have restricted my own role in this very complex research and treatment setting to the activities that I tried to summarize a little while ago. I had a number of hunches, but I got quite worried about my hunches when I saw the results that I just showed on the two slides. I was surprised myself, and my surprise indicates that I did not predict properly what would happen. For that reason, I have chosen to limit myself to these particular data.

I might point out, though, that there have been a number of other people who have held different views of this study, even of its outcome. Dr. Helen Witmer, who has collaborated on the first published report of this study has not considered the control group at all, in contrast to Mr. Powers and myself She has given the more traditional qualitative interpretation of what happened to the treatment group in terms of services rendered and objectives achieved. I would rather not comment on this approach.

Question from the floor: Could the failure of good results in the T group be due to the fact that the boys suffered some difficulty, for example, cerebral dysrhythmia or character disorders not responding to treatment by counseling?

DR. HANS-LUKAS TEUBER: T stands for treatment, and C for control.

The control group was left alone. They were selected in the beginning, they were matched, and they were not treated. They were simply compared at the beginning and at the end.

In the treatment group there were only very few children in whom neurological signs and symptoms were present, and those were brought to the attention of appropriate clinics. It was part of their overall treatment program.

Whether there were more or less or about the same number in the control group, we do not know. The chances are that they were about the same.

We might actually summarize the results by saying that these two groups were exceedingly well matched, over ten years ago, and they are still very well matched at the present time.

Section IV

CHAPTER XIII

CRITICAL EVALUATION OF HYPNOSIS

JEROME M. SCHNECK

In this brief critical evaluation of hypnosis in psychotherapy, the following areas will be surveyed—field of application; various hypnotherapeutic techniques; apparent advantages of hypnosis in treatment; and problems and precautions relating to hypnotic methods.

FIELD OF APPLICATION

Hypnotherapy is applicable to a wide variety of approaches in psychotherapy. Relatively isolated, circumscribed problems or individual symptoms may be investigated with the goal of insight and relief. Hypnosis may be employed for its relaxing effect with added reassuring comments in order to allay anxiety. Direct symptom removal may be attempted without an insight approach. Interpersonal relationships may be explored at varying levels from essentially consciously available material to data deeply imbedded in the unconscious and elicited slowly over a long period of time. Psychological functioning of patients may be studied to varying degrees and length based on the needs and desires of the individual patients and the clinical judgment of the therapist.

Hypnotherapy may be aimed at uprooting important buried memories and integrating the past and present, clarifying attitudes toward the self and others, understanding the significance and role of symptoms, elucidating patterns of behavior and psychological defenses, clarifying goals and striving toward them. Hypnotherapy may be supportive and it may attempt to reconstruct, but it is always limited by contemporary knowledge of psychodynamics in general.

HYPNOTHERAPEUTIC TECHNIQUES

Hypnotic techniques are numerous. The hypnotic state is relaxing for many and furthers over-all psychological comfort for some patients. Carefully-worded suggestions for symptom relief or attitude alteration are most helpful when in keeping with patient needs and based on preliminary study

of the patient's personality. Such information will influence the manner and tone of the therapist, choice of words, points of stress, and the ability to capitalize on known or inferred strivings of the patient. Unconscious functioning appears to be more accessible to many people while in hypnosis. Thus, face-to-face conversational interviews with the patient in the hypnotic state are often beneficial. Free association during hypnosis is a frequently-used procedure.

Visual imagery may be employed as an uncovering technique. Hypnotic dreams, structured or unstructured, are often used. Scene visualizations wherein the imagery approximates daily events rather than dream-like settings may be used also to elicit pre-conscious or unconscious material. Visual imagery techniques may be used to elicit buried memories, clarify goals, evaluate the transference relationships, evaluate conflicts and experiment with their possible solution. They may serve as an hypnotic experiential setting to initiate conditioning for altered and better patterns of behavior. Nocturnal dreams on post-hypnotic suggestion may be used for similar purposes.

Controlled associations may occur when, on a given signal, the patient associates with a thought, scene, dream, emotion or other response to a suggestion of stated purpose, such as the clarification of a particular problem.

Word-association procedures of standard or modified type may be incorporated into hypnosis to clarify the psychopathology. Differences in results for hypnosis and the non-hypnotic state have been reported. The Thematic Apperception Test with emphasis on card 12M, the "hypnosis card", may be used serially to help clarify transference relationships, diagnosis, and prognosis. Also, there are differences in House-Tree-Person Test data in hypnosis and the ordinary waking state.

Automatic writing may be employed for exploratory purposes. Such writing within the setting of visual imagery may be used too. Regression and revivification, which have attracted perhaps a disproportionate amount of attention, may elicit unconscious material and help integrate past and present.

The hypnotic state itself seems to permit many patients to experience with greater intensity ideational and affective material. This is often therapeutically beneficial. Induction of auditory and visual hallucinatory experiences to permit dramatization of conflicts on a verbal and motor level with key figures and in key settings may help further participation in the therapeutic strivings. Experimental neuroses are used to produce psychological conflict situations in order to evoke inferred characteristic responses, with the relationship between the two as yet unclear to the patient. With the response evoked, the patient is then permitted to view

the relationship between the structured conflict and his pattern of response in order to help him gain insight. Dual personality induction may be of assistance at times.

ADVANTAGES OF HYPNOTIC THERAPY

Hypnotherapy, rather than replacing other methods, should be regarded as a supplement to and modification of such methods. Many patients gather insight more rapidly in hypnosis. Thinking and planning are often more productive. Initiation of productive activity by the introduction of suggestions must be distinguished from behavior based on suggestions and disappearing when the suggestions are discontinued. Hypnotic methods can increase productivity. Resistances may sometimes be undercut when desired. Resistances, however, may be analyzed when deemed essential. A positive transference stemming from hypnosis may be capitalized upon in non-analytic work. The hypnotic transference specifically, and transference relationships in general, may be analyzed when necessary.

Patients vary in the hypnotic methods they use best, and exploration must be initiated to evaluate choice of techniques. The wide variety of possible treatment techniques in hypnosis is advantageous. Hypnotic methods frequently assist in brief psychotherapy where non-hypnotic approaches may be less effective. Hypnosis may diminish treatment time in long-term contacts. A guide to this is a comparison within treatment of the patient's speed of progress when hypnosis is introduced and when it is omitted. The initial hypnotic induction procedures often serve as semi-standardized projective techniques owing to the multiplicity of reactions and attitudes toward the process itself.

Hypnotherapy is not limited in reality by any theoretical orientation and may be employed to suit the needs of therapists from divergent schools of thought. Hypnosis may be used in as few or as many of the therapeutic sessions as necessary. Patients' dependency on the hypnosis itself is, contrary to widespread opinion, less in all aspects of hypnotherapy than is dependency in non-hypnotic therapy. About 90 per cent of patients with neurotic disorders are hypnotizable, the majority entering light and medium trance states in which many hypnotic methods may be employed for hypnotherapy or hypnoanalysis.

PROBLEMS AND PRECAUTIONS IN HYPNOTHERAPY

There are many problems and precautions in the use of hypnosis. Entertainment hypnosis and professional misinformation about hypnosis increase resistances of patients to its use. Two examples are the equating of hypnosis and sleep, and the necessity for post-hypnotic amnesias for good results. Actually there is no direct relationship between classically deep

trance states and good results. On the other hand certain techniques such as production of complete post-hypnotic amnesias and immediate amnesias, experimental neuroses, and states of deep regression and revivification require a classically deep state and a minority of patients can achieve this. At times some patients enter hypnosis but do not become emotionally involved in the procedures. Then again, involvement is so intense at times that anxiety mounts considerably and resistances increase. Occasionally patients sexualize the hypnotic procedure so markedly that it must be discontinued at least temporarily. Careful therapeutic management is required for these problems.

There is no real indication that hypnosis has favorably altered the efficacy of psychotherapy in relation to the range of beneficial response from the hysterical disorders at one end to the schizophrenias at the other. It is not as yet clearly understood why some patients can employ certain hypnotic techniques more effectively than others. Classical depth of involvement and degree of emotional participation in hypnosis still cannot be adequately evaluated without trial by experience. Issues of submission and control often based on erroneous pre-conceptions sometimes unduly complicate treatment. Rapid upsurge of unconscious material appearing on occasions with the onset of the hypnotic state must be carefully managed. Counter-transference issues must be taken into consideration as with any other psychological treatment method. The greatest problem at present is the lack of adequate training facilities to insure wide application and study. More experienced hypnotherapists and careful evaluation will offset the deleterious effect of the occasional dramatic success of the novice, followed by disappointment, or the poor results by the untrained therapist. On a long term basis, success will be in proportion to experience and sincere interest.

REFERENCES

1. Brenman, M. and Gill, M. M.: Hypnotherapy, Review Series Vol. II, No. 3. New York, Josiah Macy, Jr. Foundation, 1944.
2. Erickson, M. H.: Hypnotic psychotherapy. Med. Clin. North Amer., *New York Number:* 571–83, May, 1948.
3. Erickson, M. H.: A study of an experimental neurosis hypnotically induced in a case of ejaculation praecox. Brit. J. M. Psychol., *15:* 34–50, 1935.
4. Kline, M. V. and Schneck, J. M.: Hypnosis in relation to the word association test. J. Gen. Psych., *44:* 129–37, 1951.
5. LeCron, L. M. and Bordeaux, J.: Hypnotism Today. New York, Grune and Stratton, 1947.
6. Lindner, R. M.: Rebel Without a Cause. New York, Grune and Stratton, 1944.
7. Schneck, J. M.: The elucidation of spontaneous sensory and motor phenomena during hypnoanalysis. Psychoanal. Rev., *39:* 79–89, 1952.

8. SCHNECK, J. M.: Psychogenic cardiovascular reaction interpreted and successfully treated with hypnosis. Psychoanal. Rev., *35:* 214–19, 1948.
9. SCHNECK, J. M.: Some aspects of homosexuality in relation to hypnosis. Psychoanal. Rev., *37:* 351–57, Oct. 1950.
10. SCHNECK, J. M.: Psychosomatic reactions to the induction of hypnosis. Dis. Nerv. Sys., *11:* 118–21, April 1950.
11. SCHNECK, J. M.: Hypnosis and the productive orientation. Dis. Nerv. Sys., *12:* 241–42, Aug. 1951.
12. SCHNECK, J. M.: Hypnoanalysis. Personality: Symposia on Topical Issues. New York, Grune and Stratton, 1951.
13. SCHNECK, J. M.: Hypoanalysis, hypnotherapy, and Card 12M of the thematic apperception test. J. Gen. Psych. *44:* 293–301, 1951.
14. SCHNECK, J. M. AND KLINE, M. V. Hypnotic scene visualization and the word association test. J. Gen. Psych., *46:* 29–42, 1952.
15. SCHNECK, J. M. AND KLINE, M. V. Clinical psychiatric status and psychological test alterations following hypnotherapy. Brit. J. M. Hyp., *2:* 30–40, 1950.
16. SCHNECK, J. M. AND KLINE, M. V.: Hypnodiagnosis and evaluation of therapy in psychiatry and clinical psychology: report of a case involving the h-t-p. Brit. J. M. Hyp., *2:* 8–17, 1951.
17. SCHNECK, J. M. AND KLINE, M. V.: The h-t-p and tat in hypnodiagnostic studies. To be published.
18. SCHNECK, J. M. AND KLINE, M. V.: A control study relating to h-t-p testing and hypnosis. Brit. J. M. Hyp., *3:* 2–11, 1951.
19. WATKINS, J. G.: Hypnotherapy of War Neuroses. New York, Ronald Press, 1949.
20. WOLBERG, L. R.: Medical Hypnosis. New York, Grune and Stratton, 1948.

CHAPTER XIV

PRINCIPLES AND TECHNIQUES OF THERAPY IN PSYCHOSOMATIC DISORDERS

THEODORE LIDZ

As the principles and techniques utilized in the treatment of psychosomatic disorders are in general similar to those guiding the treatment of psychiatric disorders, I shall use the short time allotted to focus upon certain of the differentiating features that have led to the need for specialistic aptitudes from psychiatrists treating medical illnesses. To delimit, I shall not discuss psychotherapeutic medicine in the broad sense that encompasses, or should encompass, all of medical practice with treatment oriented toward the individual rather than the disease; nor "psychosomatic medicine" as defined to include the neuroses because they also usually involve physiologic expression of emotional conflict. The remarks will be concerned with the psychotherapeutic efforts in illnesses in which emotional disturbances are considered one of the major, or one of the essential factors in producing structural change or lasting physiologic dysfunction.

The basic differences in principles and techniques of therapy involved arise from the differing needs of patients who become ill by manifesting the physiologic components of emotional turmoil rather than by utilizing the defenses provided by psychiatric illnesses. The emergence of sounder principles of therapy awaits clarification of the mechanisms that determine the choice of illness. The reasons why some patients with serious "psychosomatic" ailments are not psychotic, and the alternations between psychotic and physical illnesses in others, are problems that constantly recur. Whatever the reasons, the expression of emotional disequilibrium in serious somatic illness requires collaboration with other medical specialists in a way that involves more than reliance upon the other physicians' knowledge of the disease entity and its medical treatment.

The psychotherapeutic work can be handicapped appreciably unless the therapist is familiar with the medical problems. Knowledge of the potential courses of an illness is often essential in planning psychotherapeutic strategy, such as the timing of the emergence of affect-laden material. The use of alternative methods of medical or surgical treatment may depend upon the personality of the patient, and may affect the psychotherapeutic

course considerably. The extent that symptomatology can be affected by shifts in the emotional state of the patient can easily be misjudged. It is often important to know that certain illnesses and certain therapeutic regimens are apt to bring similar critical issues to the fore in most patients and require consideration of the defenses mobilized to cope with them, as when tuberculosis confronts the patient with a long period of dependency and passivity.

The critical problem concerning the specificity of relationship between personality configuration and certain illnesses, or perhaps more pertinently, the significance of certain conflictful issues to which the patient is sensitized in the etiology or aggravation of specific illnesses cannot be discussed or argued here. However, many workers in the field find that the medical diagnosis in itself often offers useful leads concerning the nature of the critical issues confronting the patient, which permit the therapist to hear the significant material amidst the multiplicity of data available. Such leads go beyond the broad generalizations offered in texts and articles, and as elsewhere in medicine, are gained from breadth of experience in observing and treating numerous individuals suffering from a given disease entity.

The fact that the patient's primary concern and interest is the medical illness creates difficulties in establishing a useful psychotherapeutic relationship. The severity of the physiologic expression seems to be related to an inability, or rather, a need not to recognize disturbing emotional problems. At times, the personality structure has developed w thout providing adequate defenses against being overwhelmed by anxiety, rage, or despair of a primitive and infantile quality. With such dire need to defend against such impulses becoming conscious, the necessary shift to interest in emotional problems is not fostered by pushing for insight into the relationship between the illness and the personality problems. "Insight therapy" does not mean insight into the connection between illness and emotional problems. Here, as elsewhere, the therapy is directed towards resolution of the disturbances in living, and it is hoped that if these are overcome, the illness will be cured or improved. It might be said, in somewhat oversimplified form, that a useful therapeutic relationship develops when the patient recognizes that his problems in living are sufficient to warrant psychiatric help, even though he considers that it is because of the illness that his situation has become overwhelmingly difficult.

The inadequacy of the personality defenses against untenable emotions adds difficulties in the course of psychotherapy, particularly in the more profoundly regressive disorders. Sometimes the illness provides secondary gains in the form of removing the need to face difficulties, or forcing passivity upon the patient that adds to the defenses of the integrity of the personality. However, the physiologic decompensation seems to be the

price paid for keeping emotional conflict unconscious and maintaining the facade of social normality. Awareness of the intensity of the emotion, such as the homicidal quality of the hostility in many hypertensive patients, may be shattering, and the patient struggles against it with desperation. Uncovering techniques, if badly timed, can exaggerate the physiologic disorder and endanger life, or provoke psychotic regression as a defense. A major difference from the treatment of neurotic disorders lies in the greater care needed in making it possible for a patient to face his problems before feeling their emotional impact. This may be achieved in a variety of ways. The simplest is to have the patient gain sufficient confidence in the therapist to feel that, bolstered by an ally, he will be able to perceive and cope with difficulties that had seemed insurmountable when unaided. Carried further, the therapist, through the transference relationship, fills the role of a needed figure of whom the patient had been deprived, and without whom he had felt helpless and lost. Frequently the patient has turned against himself, either against an incorporated parental figure, or because of the strength of the parental indictment of what the patient believes he has come to be. Increasing the feelings of guilt or worthlessness may make the patient unbearable to himself and precipitate psychotic behavior. In general, during the early phases, the therapist must ally himself with the ego, and permit or foster focussing upon the shortcomings in the significant persons in the patient's life; even to not challenging expressions of their subtle or manifest persecutions of the patient. Often, considerable attention must be paid at first to the situational problems, and the patient's helplessness in coping with them, with little emphasis upon the patient's part in producing the difficulties. Unconsciously he is all too cognizant of his deficiencies.

I believe that it is fairly clear that treating patients with "psychosomatic" illnesses requires plasticity of approach, and consideration of alternative tactics. These patients cannot readily be fitted into treatment by the single psychotherapeutic technique that happens to be the therapist's armamentarium, though, perhaps, patients can be carefully selected who can be treated by a given approach. The therapy involves consideration of a multiplicity of factors, including the nature and the state of the illness, the personality of the patient, the severity of the emotional problems and the life circumstances. Usually these cannot be adequately evaluated at the outset of treatment sufficiently to decide once and for all what sort of therapeutic regimen to follow. The need to modify the approach and shift tactics continues to present difficult and intriguing problems to the therapist. It has become quite clear that if one enters upon therapy which relies upon the transference and resolution of the transference neurosis with patients suffering from certain illness, treatment will be extremely long,

very disturbed, and is not apt to be successful without skirting upon, or entering into psychotic episodes.

A period of exploration of the personality resources is particularly necessary before starting upon intensive psychotherapy in psychosomatic ailments, and then, not infrequently, the profundity of the emotional disorder may intimidate the therapist. It becomes necessary to consider that when the choice lies between death or intense suffering and the possibility of health, the psychiatrist, like his surgical colleague, must sometimes accept grave risks when there is no alternative.

CHAPTER XV

SETTING GOALS OF TREATMENT IN PSYCHOSOMATIC MEDICINE

MILTON ROSENBAUM, MORTON F. REISER AND JOHN HIGGINS

The concept of what constitutes a psychosomatic disorder varies considerably. Some consider as psychosomatic only those psychogenic disorders which may be considered to be "organ neuroses" in the psychoanalytic concept of the term. Others have a broader concept of the term to include any disorder in which emotional factors play an important role in etiology, precipitation or exacerbation (1). Unfortunately, many physicians now use the term as a substitute for the term psychoneurosis especially in those neurotic disorders in which the presenting symptoms and signs are expressed somatically such as an hysterical headache. Our concept of psychosomatic medicine can be defined as an attitude or approach to illness in which efforts are made to determine the totality of forces responsible for the breakdown in the adaptive functioning of the individual and to plan treatment accordingly. An approach of this sort is distinguished by three main characteristics: 1) the individual patient is the central point of the physician's main interest rather than the disease from which he suffers; 2) psychodynamic understanding of human behavior and personality functioning is utilized and applied in both the diagnostic and therapeutic phases of medical practice; 3) psychogenic factors are recognized as capable of playing an etiological role in structural disease. It should be clear that this is not a substitute approach but rather one which adds to the methods and procedure of accepted medical practice.

Most of the recent work in psychosomatic medicine has revolved around a reexamination of disease processes and well established disease entities in the light of modern psychodynamic principles. Despite the progress made in recent years in advancing the understanding of psychosomatic disorders, it must be remembered that we are still in a pioneering stage. Since the boundaries and land-marks defining the field of psychosomatic medicine remain unclear, especially in the area of treatment, physicians working in this field are faced with additional anxiety. Therefore it is important at this time to establish goals of treatment not only for the purpose of reaching the best possible therapeutic results in any case, but mainly

to offer a frame of reference for the physician so that he can deal with these disorders with a minimum of anxiety and frustration and thereby become more effective in his therapeutic work. To this end, it has been found quite useful to set up a tentative spectrum of therapeutic goals which vary from "giving up" completely in some cases to the working toward a complete cure in others. In the majority of cases the goal is set somewhere between these two extremes; the aim is toward varying depths and degrees of overall improvement and better functioning.

Obviously, when dealing with both physical and emotional factors the goals of therapy must be defined by the limitations and potentialities in both areas. Consideration of either of these two problems separately presents no special difficulties to the physician trained in the appropriate discipline. However, in most instances a complicated interrelationship between these two areas exists. It then becomes necessary to examine some of the special characteristics of this interrelated area since it is precisely there where factors appear which often indicate modification of procedures which might have been considered appropriate if only one aspect of the problem were considered.

The most important variables to be considered in setting goals of treatment are: 1) the present status of the functional and structural changes; 2) the psychological formulation of the patient's personality structure and conflicts; 3) the present status of the environmental stresses, and 4) the role of the physician. The proper evaluation of therapeutic goals depends upon an understanding of these factors and their interrelation. Essentially, this consists of an accurate appraisal of the disease mechanisms or processes which are actually responsible for the patient's current symptoms and disabilities; and an evaluation of their potential reversibility in respect to the four major variables listed above.

PRESENT STATUS OF FUNCTIONAL AND STRUCTURAL CHANGES

Understanding the present status of the functional and structural changes as related to the underlying patho-physiology is of prime importance in setting therapeutic goals. Thus, in a patient with malignant hypertension which has progressed to the phase of renal decompensation, the degree of kidney failure must be regarded as the limiting factor regardless of the fact that the processes may have been precipitated by clearly understandable and potentially reversible emotional stresses (2). On the other hand the underlying pathology may not be the limiting factor. For example, the physician may relate the symptoms and resulting disability in patients with clear-cut evidence of structural changes directly to the underlying pathology and consequently set very limited therapeutic goals when in reality a proper evaluation of the symptoms would lead to more ambitious goals. Such

mistakes are commonly made in those patients with cardiovascular disease in whom the symptoms and disability are actually related to chronic emotional problems. Many patients of this sort are found to be functioning at a level considerably below that which the underlying cardiovascular lesion would permit, and often they fail to achieve the degree of overall improvement which would be possible for them because of the fact that treatment goals have been set too conservatively. Similarly, in some young patients with diabetes, frequent attacks of acidosis may be more a reflection of a severe personality disorder than they are of the severity of the endocrine changes (3). In many instances of this sort, a therapeutic goal aimed at decreasing the frequency of acidotic attacks can be realized by focusing on the emotional stresses rather than the dietary and insulin regime. In others, the severity and irreversibility of the emotional disturbance serves as the limiting factor and the therapeutic goal must be set below what one would hope for on the basis of the endocrine changes alone.

It would be quite simple to use the natural course of a disease as the chief criterion in setting of therapeutic goals, but it must be realized that it is only through a psychosomatic approach to disease that evidence will accumulate by which the natural course of disease may be adequately defined. Illustrative is a completely bed-fast patient recently examined on the medical service with the proven diagnosis (biopsy) of dermatomyositis. Although the medical staff had adopted a hopeless attitude regarding prognosis, a psychosomatic study of the patient revealed important areas of emotional conflict related to the onset and aggravation of the disease. This conflict was giving rise to a reactive depression which was the most important factor in producing the current intense disability, and as such was treatable. As a result of these findings an original hopeless therapeutic goal gave way to one which aimed at returning the patient to limited but productive work activity.

PSYCHOLOGICAL FORMULATION OF THE PATIENT'S PERSONALITY STRUCTURE

The consideration of psychological factors in a given patient includes an assay of the role that emotional stress may be playing in the disease processes; namely, whether it is operating as a primary etiologic factor or as a precipitating factor; or as a force which modifies the course of the disease and which acts as a determinant of prominent symptoms. In addition to the usual psychiatric criteria used in assaying personality strength, special emphasis must be directed toward understanding the meaningful content of the emotional precipitating factors in relation to the psychosexual level of the genetic conflicts to which they are related. Often the genetic problems are found to be pre-genital in origin and a clear appreciation of their nature may then be decisive in establishing a limited therapeutic

goal, such as one aimed toward reducing the frequency and intensity of the exacerbations of the illness, rather than toward cure.

The comparison of the cases of two adolescents with neurodermatitis may serve as an example. In one, the emotional conflict and personality disorder was related to intense emotional rejection and deprivation in early infancy, while in the other the emotional problems centered around sexual conflicts at an oedipal level. The therapeutic goal in the first case was aimed at relieving symptoms and decreasing the frequency and severity of attacks by the institution of a supportive and protective regime, while in the second a high therapeutic goal was set which aimed at basic personality reorganization through intensive psychotherapy.

The therapeutic goal may depend upon the degree to which the disease process has been integrated into the total psychological economy. Of particular importance is the extent to which the symptoms and illness are being utilized as part of central defense mechanisms. Where this is the case, the therapeutic outlook may depend to a large extent upon the degree of ego flexibility, i.e., upon the availability of substitutive and more mature defenses, and the patient's potential ability to develop and utilize such resources. Thus, in a pathologically obese patient in whom excessive eating has served as the main vehicle for draining pregenital libidinal energy and whose distorted size has been the central theme of most or all inter-personal relations, one would not expect definitive improvement from a regime of enforced diet, pharmacologic gastric inhibitors and a supportive relationship. On the other hand, in a patient with a more flexible previous adjustment who has developed obesity in response to an intensely stressful situation which has since been resolved—or which is workable—the therapeutic goal may be set at a much higher level. Pertinent in regard to this problem of the binding of anxiety through illness are the observation of Szasz (4) on the psychological sequellae of operative intervention in patients with peptic ulcer whose ulcers had occupied central positions in the psychological economy.

It has been emphasized that in some patients a psychosomatic disorder may operate as a defense against a latent psychosis (5). The actual frequency of such occurrences has not been established and has been seldom encountered in our experience. When tensions have arisen in a patient during treatment, in most instances the pathophysiological pathways of the disease have been reactivated, and this may have served as the buffer against psychotic breakdown. The concept that in certain instances a psychosomatic disorder and psychoses are interchangeable should be considered in setting therapeutic goals but a rigid adherence to this concept as a generalization may act as a factor which limits therapeutic goals unnecessarily.

ENVIRONMENTAL STRESS

The main points to be considered in evaluating environmental stress are: the quantity of tension being engendered by environmental frustrations and deprivations; opportunities in the environment for either direct or satisfactory substitutive gratification of instinctual needs; opportunities for rewards for adequate behavioral patterns; and finally whether or not improvement creates further environmental stress. Illustrative is a patient with a peptic ulcer in whom ego satisfactions gained from financial security and from professional prestige allowed a very high therapeutic goal despite severe dependency frustrations engendered by an unsatisfactory marriage.

The presence of acute and chronic disability and primary and secondary dependency problems may create intense intrafamilial tensions and discord, and often the therapeutic goal is as reliant on the possibility of modifying attitudes of key members of the family as it is on the factor pertaining to the patient himself.

ROLE OF THE PHYSICIAN

The establishment of an optimal patient-physician relationship is of great importance in affecting the course of disease. Often it is through the medium of this relationship and the supportive and corrective emotional experiences it may provide that much can be accomplished in the handling of patients with medical problems (6, 7). The central points to be considered in relation to the role of the physician in setting therapeutic goals are: his sensitivity to psychological factors as well as physical aspects of disease; his ability to accept transference manifestations, especially those of a dependent nature; his understanding and awareness of countertransference attitudes; and his ability to accept limited therapeutic goals. In many chronic diseases, specificity both of etiology and treatment may be lacking. This taxes and drains both the patience and skill of the physician with the result that his normal narcissistic needs are often frustrated and he feels helpless. Frequently the physician responds with a hostile defense and the patient becomes the target of hostility and a vicious cycle is established with both physician and patient the loser. Those physicians who because of personal reasons have high therapeutic ambitions, and those physicians who, seduced by the glamor of psychodynamics, unfortunately equate psychological etiological factors with complete reversibility are apt to fare badly. To some physicians merely placing a patient in the category of suffering from a "psychosomatic disorder" automatically spells out the highest therapeutic goal. A possible result would be that the hostility of the physician arising from therapeutic frustration might create tension in the treatment situation which in turn would block attaining therapeutic

goals which could have been reached by establishing more realistic goals initially. The responsibility here must be shared by both the internist and psychiatrist. Perhaps even more culpable are those psychiatrists whose experience in this field is limited to highly selected patients, or who lack experience gained by close contact with large groups of unselected general medical and surgical patients.

DISCUSSION

As the result of the forgoing synthesis and formulation, it is important to decide the amount and type of improvement that can be expected from an individual case. As previously mentioned the ideal goal consists of a cure, which means resolution of the structural impairment plus effective reorganization of the personality so that instinctual needs and tensions arising in life relationships will no longer utilize pathological physiological mechanisms and pathways. Short of this ideal state there are varying degrees of overall improvement in terms of greater capacity for general life adjustment and varying degrees of learning to avoid situations and reactions which might lead to the activation of the physiological mechanisms of disease. In decreasing height of therapeutic ambitions these can be listed as follows: 1) more mature general life adjustment; 2) increased capacity for physical functioning and occupational activity; 3) amelioration of the course and progress of the disease which would include slowing down the rate of progression and perhaps some degree of reversal of functioning and structural changes; 4) avoidance of complications and exacerbations of the basic disease process; 5) decreased utilization of the secondary gain provided by the illness and increased capacity to adjust to the presence of disease; 6) symptomatic relief alone. It should be remarked in passing that although relief of symptoms is placed at the bottom of the list in certain circumstances it may constitute a matter of vital importance, namely; in the acute phases of certain disorders such as bleeding peptic ulcer, hypertensive encephalopathy, acute phase of ulcerative colitis, etc. (8). Short of goals involving cure and personality reorganization, the types of improvement listed are all in the realm of the activities of the well-trained and interested non-psychiatric physician particularly if psychiatric supervision is available.

It should be emphasized that the keynote in setting goals is flexibility. The possibility of lowering or raising the goals should be continually kept in mind since the disease-processes and treatment are dynamic and therefore can be expected to undergo continuous change. The main value of goal-setting is to supply a secure and realistic frame of reference for the physician.

SUMMARY

A spectrum of therapeutic goals in psychosomatic medicine has been described. The most important variables to be considered in setting goals of treatment are: 1) the present status of the functional and structural changes; 2) the psychological formulation of the patient's personality structure and conflicts; 3) the present status of the environmental stresses, and 4) the role of the physician. The proper evaluation of therapeutic goals depends upon an understanding of these factors and their interrelation. It has been emphasized that the keynote in setting goals is flexibility.

BIBLIOGRAPHY

1. Alexander, Franz: Psychosomatic Medicine. New York, W. W. Norton and Co., 1950.
2. Reiser, Morton F., Rosenbaum, Milton and Ferris, Eugene B.: Psychologic mechanisms in malignant hypertension. Psychosom. Med., *12:* no. 3, 147–159, May–June 1951.
3. Rosen, H. and Lidz, T.: Emotional factors in the precipitation of recurrent diabetic acidosis. Psychosom. Med., *11:* 211, 1949.
4. Szasz, T. S.: Psychiatric aspects of vagotomy. Psychosom. Med., *11:* 187, 1949.
5. Swartz, J. and Semrad, E. V.: Psychosomatic disorders in psychosis. Psychosom. Med., *11:* 314, Sept.–Oct. 1951.
6. Crede, Robert H., Rosenbaum, Milton and Lederer, Henry D.: Treatment of psychosomatic disorders by the general physician. J. Amer. Med. Assoc., *143:* 617–620, June 17, 1950.
7. Reiser, Morton F., Brust, Albert A. and Ferris, Eugene B.: Life situations, emotions and the course of patients with arterial hypertension. Psychosom. Med., *12:* no. 3, 133–139, May–June 1951.
8. Reiser, Morton F. and Higgins, John: In-patient treatment of psychosomatic disorders. To be published.

CHAPTER XVI

APPRAISAL OF THE RESULTS OF TREATMENT IN STRESS DISORDERS

Preliminary Report

BEATRICE B. BERLE, RUTH H. PINSKY, STEWART WOLF AND HAROLD G. WOLFF

The present study concerns a group of ambulatory patients with a variety of bodily disorders and diseases which are commonly thought to be related to stressful experiences in the life situation. Attempts have been made to treat these patients as people reacting to problems and challenges in day-to-day life and to appraise the results of treatment. The full report to be published at a later date will include comparison with a control group treated by methods which did not emphasize personality adjustment. The present communication offers a preliminary report on the results of treatment of 739 patients encountered in the first three years of operation of a special clinic and followed for one or two years after discharge.

BACKGROUND—MATERIALS AND METHODS

In March 1946 a special clinic was organized in the Department of Medicine at New York Hospital. It was designed to deal with patients having bodily disorders assumed to be related to their life adjustment. In the five and a half years of operation of the clinic approximately 2,000 patients have been seen by 29 different physicians. The patients were unselected in so far as it was possible. A minority of patients were referred from other clinics or from the wards; most of the patients were admitted directly through the out-patient admitting physician. His instructions were to send to this clinic whatever patients appeared to have symptoms indicative of the bodily disorders which were being studied at the time. These are listed later. He was specifically instructed not to look for nervous people. Neither was he to select people because their symptoms and bodily disturbances seemed to correlate with troublesome events in their lives.

In contrast to the relatively unselected patients, the physicians working in the clinic were a highly selected group. Most of them were young men three to five years out of medical school whose past records had been

outstanding. Each of them gave prominent evidence of an interest in and a concern for his fellow man and in problems of personality adjustment in general. The training of these young men had been chiefly in internal medicine for two to five years on the house staffs of university hospitals. Many of them had had one or more years of experience in psychiatry in World War II; a few had had special training in psychiatry in civilian life; others had had no formal background in psychiatry. The contacts of these physicians with patients were closely supervised by a mature psychiatrist with broad experience in teaching. During the early phases of their work in the clinic he often sat in on interviews with patients. In addition, the psychiatrist held regularly scheduled teaching sessions with the group of young physicians. These were devoted to case studies and to problems in psychodynamics and psychopathology. Sessions with patients usually lasted an hour, were conducted face to face and occurred at weekly intervals at first, gradually tapering off to two or three times a month and finally to semi-monthly periods or even longer.

TECHNIC OF TREATMENT

In therapy, the attempt was to marshal all of the technics which could be used in the setting described. These varied from being almost non-directive to highly directive, from predominantly suppressive to vigorous exploratory activity. Sometimes projective technics were used, free association and dream analysis. Special note was made of the family and cultural background of the patient. The state of his health was correlated with events, overt activities, attitudes, and emotional responses. The objective was to understand the motivations and mechanisms of disturbed function and thus to help the patient to an understanding of the nature of his illness and of himself, and of the implications of his costly adaptive pattern.

The patient's emotional development during infancy, childhood and adult life was appraised by eliciting from him a biographic review and also by allowing him to express freely his associations with significant life events and his feelings about them. In so far as was possible, physiologic changes, qualitative and quantitative, were correlated with the emotional reactions and behavior pattern of the patient under varying life situations. When his past experiences and reactions could be integrated with the present, perplexity was often replaced by a grasp of the dynamic mechanisms at work. When this therapy was successful the resulting reorientation and maturation seemed to entail a developing self-confidence in the patient, a belief in himself, his potential and in the people and the world around him. It was our impression that the most powerful tool to this end was the attitude of respect for the individual and belief in his potential

which the physician demonstrated in his relationship with his patient.

The physician's affirmative attitude included recognition and praise of the assets and achievements of the patient and an unswerving interest in and concern for whatever problem or question the patient brought to the doctor.

The free expression of conflicts and feelings was encouraged and often was associated with relief from anxiety and resentment and in less need to act out emotional conflicts in a socially undesirable manner. Such free discussion of events, attitudes, fantasies, and dreams also resulted frequently in the patient making useful discoveries about himself.

Since hostility, suspicion, guilt and anger were exhibited in many and subtle ways, the physician had to become familiar with their indirect manifestations. They showed themselves in lateness for appointments, breaking appointments, in sarcasm, misquoting or misinterpreting the physician's words from a previous interview, denying that anything was being accomplished, refuting what had seemed acceptable at an earlier visit, or disapproving of some personal mannerism of the physician or article of his clothing. Frequently encountered evidence of unexpressed hostility was exhibited in the patient's becoming laconic or in his finding any utterance extremely difficult. With caution the patient's attention could be directed to his attitudes and emotional state; when possible, the physician would indicate their genesis in past experiences, suggest how common they were in his day-to-day life pattern, point out their relevance to his illness, and occasionally make suggestions as to their management and alteration for the better.

It was usually unnecessary for the patient to "act out" in a histrionic way the full force of his feeling. Rather the physician tried to release tension bit by bit, to assure the patient that it was safe to release it, to instruct him piecemeal as to the meaning of the tension, and cautiously to educate him as to his own nature and how and why he had developed the pattern of repressing hostility.

When the patient was tentative, the desirability of making commitments was emphasized and efforts were made to show him that one could and must risk doing so.

Through spontaneous and free discussion the patient learned to recognize and acceptably express his hostility. When the physician encouraged the patient to express his hostile feelings more freely he often interviewed as a precautionary measure the friend or member of the family who was the target of the patient's anger. Also, the development of all possible means of suitably though vicariously expressing aggression were encouraged, including vigorous or even violent sports, such as hunting, shooting, and boxing.

The successful demonstration that assertiveness was unaccompanied by untoward effects often depended upon the physician's "standing by" to lend support during possible crises or feelings of panic. Because of the patient's suspiciousness and sensitivity to being "pushed around", encouragement and support had to be tendered with great circumspection. Hence, at certain times, patients were allowed more than usual latitude in the matter of appointments, and to initiate the progressive steps in the therapeutic development.

The degree to which the patient needed to assert his independence would in large measure guide the manner in which support was offered.

Improvement was frequently achieved without the patient's verbal expression of insight. Many patients who appeared to have developed some comprehension of the dynamics of their illness did not express it. In some of these pride and a need of feeling self-sufficient prevented an admission of improved understanding. However, it was often conveyed indirectly to the physician.

When a reorientation of attitude was achieved it entailed far more than a personal attachment to the physician. Rather, there was developed in the patient faith and confidence in himself which made it possible for him to abandon costly inappropriate patterns and to deal more directly and constructively with the threats and challenges of day to day living.

APPRAISAL OF PATIENTS

Each physician was asked to make an appraisal of his patient's clinical condition at six-month intervals, at the time of discharge from the clinic and at the one- and two-year follow-up periods. The patients were classified in one of three categories:

1. *Unimproved*—this included patients in whom no clinical improvement was noted, those whose symptoms became more severe and those who died.

2. *Symptomatically improved*—this category referred to those patients whose symptoms were either substantially better or entirely gone but who, when denied the support of the clinic or when placed in a new situation of challenge, suffered recurrences.

3. *Basic improvement*—this category referred to patients who were not only symptomatically improved but who had also undergone a reorientation or maturation of attitude and behavior so that they had been able to meet without bodily disturbance new situations of the type to which they had previously reacted with symptoms and disease.

The authors reviewed with each physician the appraisal of each of his patients in order to obtain a maximum of uniformity in classification. These

classifications were then correlated with 852 individual items descriptive of the patient and listed under 49 main headings as follows:

1. Age
2. Admission information (sex, marital status and employment)
3. Race—nationality
4. Religion
5. Doctors in charge
6. System review
7. Past medical history
8. Diagnostic headings
9. Family (general information)
10. Spouse
11. Children
12. Whether and what type contraception used
13. Childhood
14. School attendance
15. School adjustment
16. Mother
17. Father
18. Family values
19. Siblings
20. Employment
21. Employment adjustment
22. Sex—childhood
23. Sex—adult
24. Housing
25. Attitude
26. Behavior
27. Estimate of previous life experience
28. Stress situations in past
29. Previous treatment
30. Life situation precipitating present illness
31. Estimate of information
32. Duration of illness
33. Intensity of illness
34. Patient's attitude toward illness (admission)
35. Patient's attitude toward illness (during treatment)
36. Patient's attitude toward treatment (at admission)
37. Patient's attitude toward treatment (during course of treatment)
38. Course
39. Mood during course
40. Therapy by physician
41. Therapy by social worker
42. Reasons for leaving clinic
43. Result on leaving clinic
44. Appraisal of those still in clinic
45. Follow-up first year
46. Follow-up second year

47. Number of visits
48. Number of months
49. Clinic financial rating

The selection of these items was based upon the general experience of the entire group of physicians, and in particular upon their impressions from dealing with the patients in the clinic.

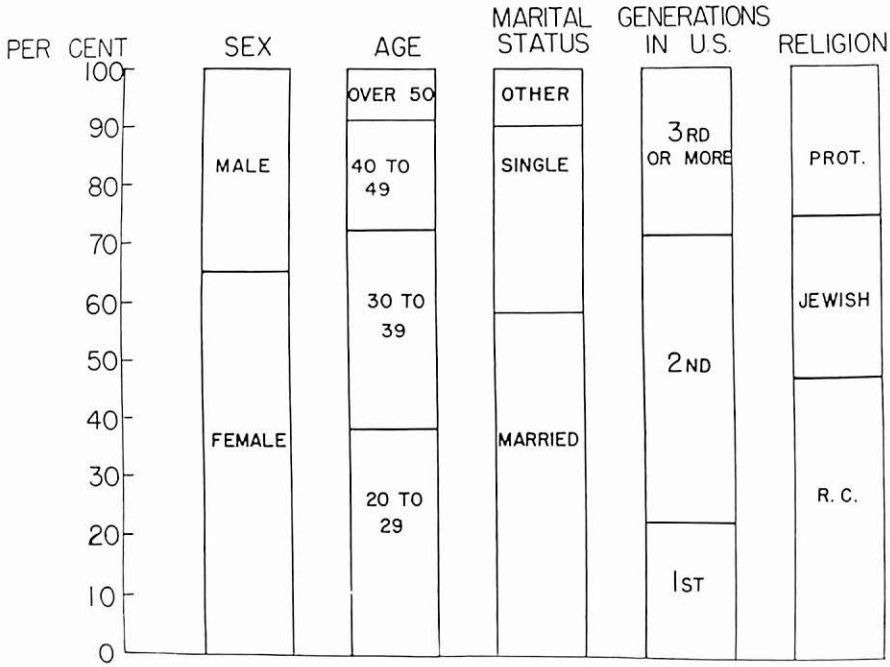


Fig. 2. Survey of the clinic population showing percentage of various individual characteristics.

RESULTS

A diagrammatic representation of sex, age, and other characteristics of the clinic population is shown in figure 2. A list of the commonest diagnoses is as follows:

Vascular headache (including migraine)	75
"Irritable colon"	62
Asthma	56
Headache from sustained contraction of skeletal muscles	54
Pain in back and extremities from sustained contraction of skeletal muscles	49
Peptic ulcer syndrome	35
Essential hypertension	29
Urticaria	25
Vasomotor rhinitis	21

Impotence	21
Diabetes	19
Gastric hypofunction	16
Paroxysmal tachycardia	16
Ulcerative colitis	13
Dermatitis	11
Eczema	7
Other (arthritis, cardiospasm, dysmenorrhea, etc.)	230

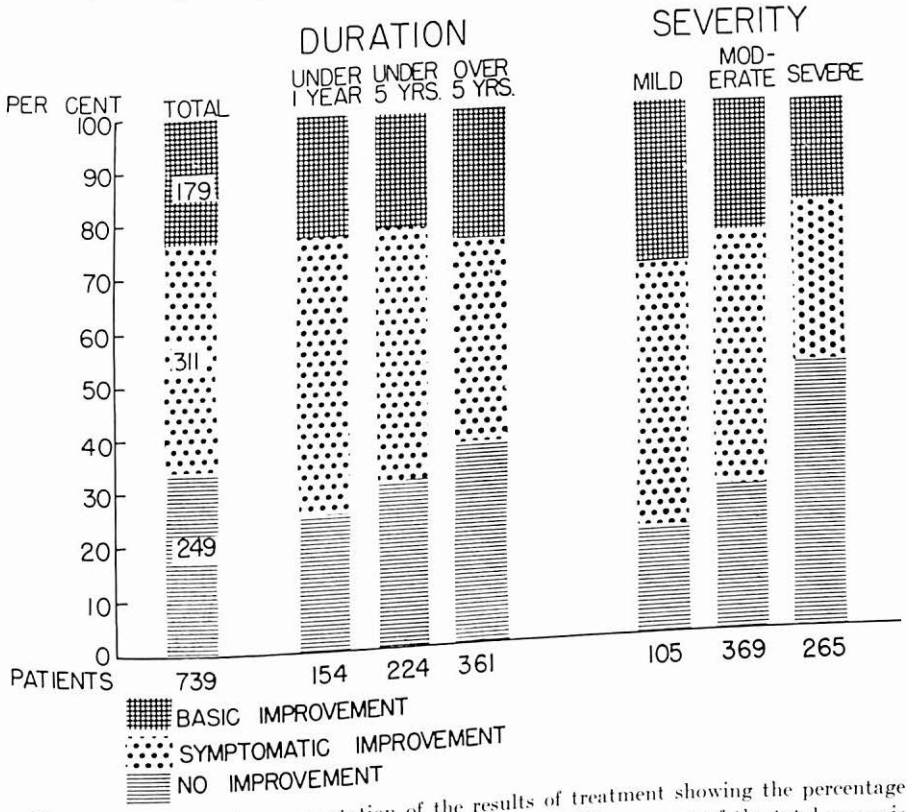


Fig. 3. Diagrammatic representation of the results of treatment showing the percentage of the clinic population in each category of improvement. The average of the total group is compared with "breakdowns" as regards Duration and Severity.

Twenty-six patients who were found to have Huntington's chorea, tuberculosis, cancer, Parkinsonism, keratitis, Menière's disease, congenital lues, bronchiectasis, pregnancy, Mediterranean anemia, patent ductus arteriosus, coarctation of the aorta, glomerulonephritis and amebiasis were not included among the 739. In figure 3 is shown diagrammatically the amount of improvement achieved in the group as a whole and separately among those whose symptoms had been of varying duration and severity. It will be noted that a third of the patients failed to show improvement,

that a quarter of the patients achieved what was classified as "Basic Improvement" and the remaining group comprising slightly more than two-fifths showed "Symptomatic Improvement". It would appear that the shorter the duration and the less the severity of symptoms the more likely would improvement occur. In figure 4 differences in age and previous health are correlated with the over-all average in terms of improvement. It will be seen that those under forty did slightly better than those over forty and that those whose previous health had been good showed more than average

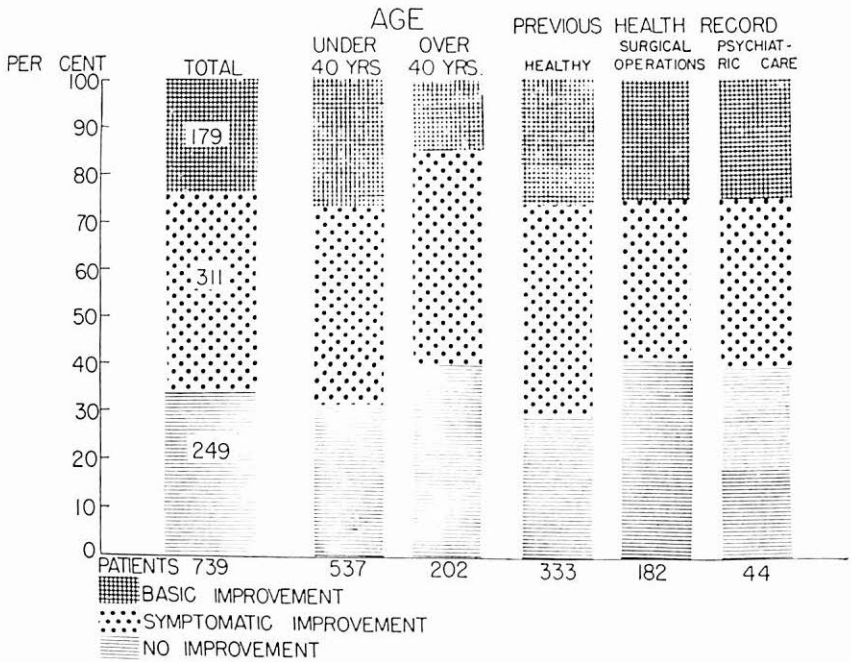


Fig. 4. Diagrammatic representation of the results of treatment showing the percentage of the clinic population in each category of improvement. The average of the total group is compared with "breakdowns" as regards Age and Previous Health Record.

improvement while those who had had previous surgical operations for their symptoms or previous psychiatric care showed less than average improvement. In figure 5 the figures are broken down to show the number of visits to the clinic and the total number of months of treatment. It will be seen that the best results were achieved in neither the very short nor the very long periods of treatment. The depth of the change effected depended on the ability of the patient to use his resources in developing improved patterns of reaction rather than on the frequency of the interviews or the over-all duration of the patient-physician relationship. Figure 6 shows a comparison of the results in each of the diagnostic categories.

The question as to whether the results achieved differ from those which

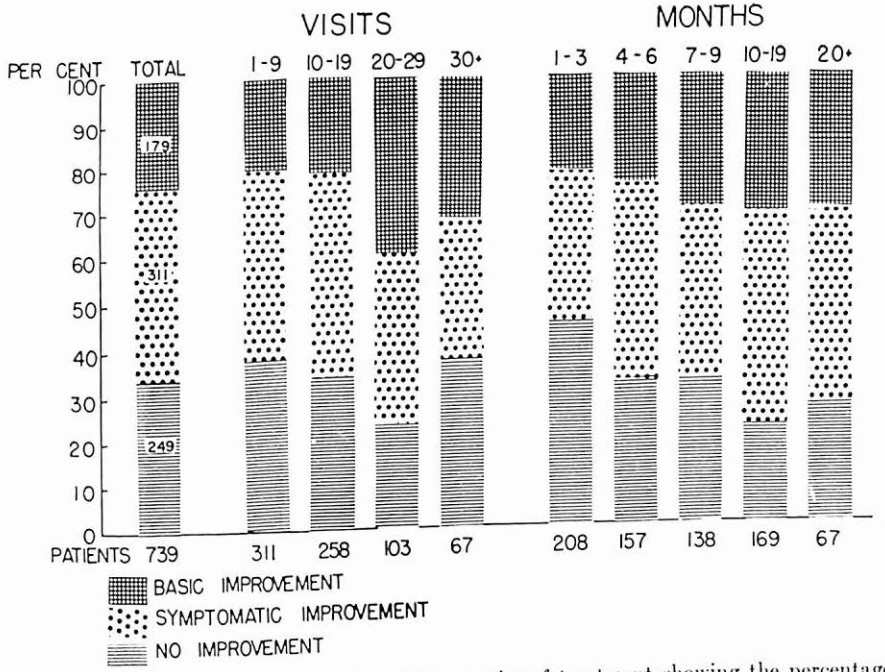


Fig. 5. Diagrammatic representation of the results of treatment showing the percentage of the clinic population in each category of improvement. The average of the total group is compared with "breakdowns" as regards number of visits and total number of months of attendance at clinic.

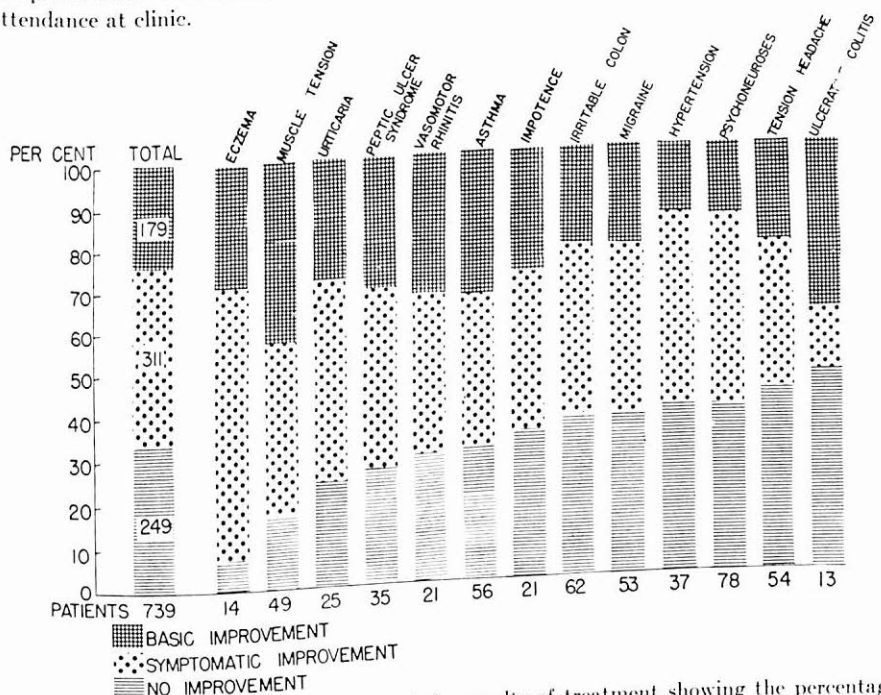


Fig. 6. Diagrammatic representation of the results of treatment showing the percentage of the clinic population in each category of improvement. The average of the total group is compared with "breakdowns" as regards the various diagnostic categories.

might have occurred spontaneously cannot be completely answered at the present time although a study is in progress to ascertain how much better or worse the results are than those achieved in patients treated in medical clinics by conventional methods. A comparison in patients with one of

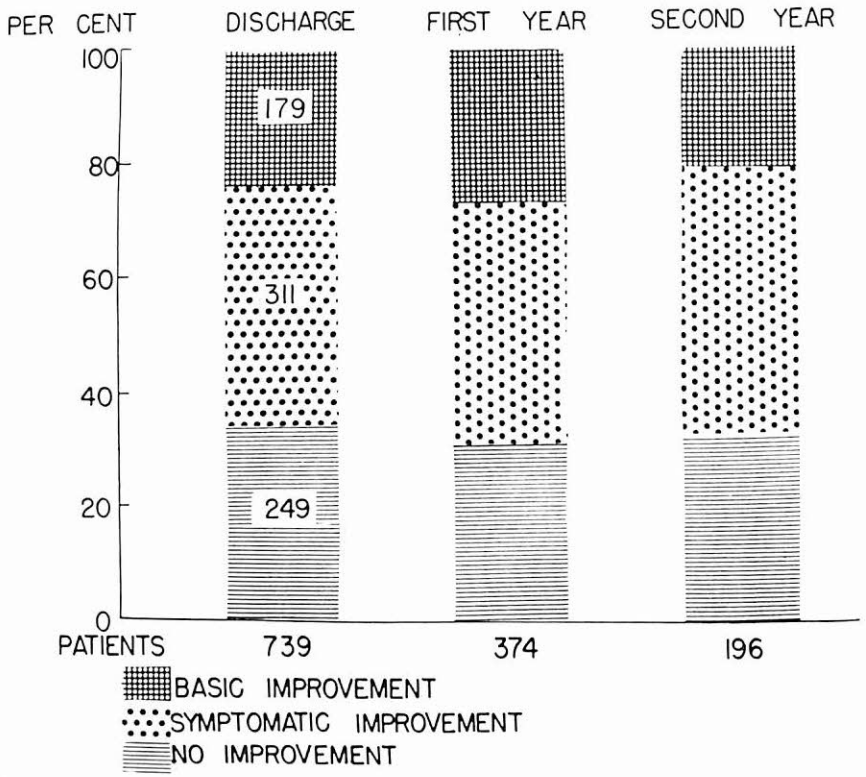


Fig. 7. Comparison of the results of treatment at the time of discharge with those at the end of the first year and second year of follow-up.

TABLE A.—ULCERATIVE COLITIS

Results of treatment of ulcerative colitis in a special clinic compared to the results achieved in a comparable group as closely matched as possible and treated in other clinics of the hospital

TOTALS	DIED	OPERATIONS	WORSE	SAME	IMPROVED	SYMPTOM FREE
Med. A (34)	3 = 9%	1 = 3%	0	8 = 23%	13 = 39%	9 = 26%
Match (34)	6 = 18%	*10 = 29%	2 = 6%	7 = 21%	6 = 18%	5 = 15%

* 2 died following operation.

the disorders treated, namely, ulcerative colitis, has already been completed. To the thirteen patients with ulcerative colitis seen during the first three years of operation of the clinic, and described above, were added an additional twenty-one seen during the subsequent three years. This

total group of thirty-four comprises the entire population of the clinic with ulcerative colitis. These patients were carefully matched with thirty-four others treated in various other clinics of the New York Hospital. Matching was made as precisely as possible according to sex, age, severity and duration of the illness. The matching patients were carefully selected according to the damage reflected in X-ray and proctoscopic studies of the colon. In each group there were twenty-four females and ten males. Ages ranged from fifteen to fifty-four years of age. Twenty patients in each group were classified as being severely ill, nine moderately, and five mildly ill. The duration of illness in both groups ranged from one month to more than ten years. A comparison of mortality rates and therapeutic results in the two groups is shown in Table A. Despite the small numbers involved, these differences appear to be significant. A full report of this study of matched cases of ulcerative colitis is being reported separately by W. J. Grace. When comparisons in other groups have been completed, they will also be reported separately.

FOLLOW-UP

The follow-up appraisal was made in the first year on 374 patients (of the 574 who were eligible for this further study). This information was gathered from 194 patients who made one to two revisits to the clinic and from 180 patients who answered letters. In the second year information was secured on 196 of the 516 patients who were eligible. Of the 196, 92 made revisits and 104 answered letters. The comparison of the clinical state at discharge with the first and second year of follow-up is shown in figure 7. Although the figures are almost exactly the same, 107 individuals shifted from one group to another in the first year and 28 in the second year. Most of the shifts were between the "No Improvement" and "Symptomatic Improvement" groups.

SUMMARY

The operation of a medical clinic where patients are dealt with in terms of their personality adjustment has been described. In addition, we have offered a preliminary report of an attempt to appraise the results of treatment of these patients. It was found that a third of the patients failed to show improvement, that two-fifths improved symptomatically, and that a quarter showed improvement which was considered basic and which appeared to include a reorientation or maturation of the personality. Some correlations have been drawn, others will be offered in subsequent reports and ultimately an attempt will be made to compare the results of treatment in this group with a control group of patients as closely matched as possible. The result of this comparison in the case of ulcerative colitis is already available and has been briefly summarized.

CHAPTER XVII

FACTORS INFLUENCING THE EFFECTIVENESS OF TREATMENT IN PRIVATE PRACTICE OF PSYCHIATRY

WENDELL MUNCIE

The problem I have been asked to discuss is limited to the field of private practice. I find this a difficult task, for the issue runs over at every turn into the broader issues of the effectiveness of treatment at anyone's hands, be he in private practice or otherwise.

I will attempt however to curb the latter tendency and stick to the issue of the practitioner. Who is this person? He is, on the average, a man or woman of five years' hospital training, who has elected, or for other reasons been forced into the position of offering his services, in a competitive situation, to the community in which he has chosen to live. He lives in, by the tolerance of, and off the community. He is judged by the layman as adequate in direct relation with his therapeutic successes. Judgment by his own colleagues is apt to be less simple and colored by basic conceptions of treatment of the most various sorts. In the long run, I believe the lay judgment must prevail, for the same reasons that the jury system in law still appears to most of us more sound than abdication of that function to legal experts.

Estimates made from the survey of Muncie and Billings (1) of 1950 would indicate that every week some 8000 new patients are consulting practicing psychiatrists, and that in the course of any one week, 50,000 patients are seen by psychiatrists for consultation or treatment. Yet there is no way at present of checking on the effectiveness of psychiatric treatment. Kubie (2) in his recent survey of the conditions of psychoanalytic practice pointed to the elementary needs in this field.

There are some relevant bits of circumstantial evidence available. For example: the demand for psychiatric services is great and the need for more psychiatrists is generally admitted. It is also a fact that patients *are* helped, and *may* even *get well* on occasion, and both patients and physicians partake of a feeling of satisfaction in the treatment experience. I would judge it a common experience with psychiatrists who have newly entered on practice to feel a sharp acceleration of the rate of learning and of therapeutic skill. If we discount the illusion in this arising from the heady intoxication of gratification expressed directly to him by patients, it still is likely

true that the assumption of full responsibility *does* in fact lead to just the thing he feels, namely a maturing of his clinical acumen. Lastly, our survey showed that the percentage of uncollected bills is a very small figure indeed—two per cent—which argues in a crude way for the general theory of the effectiveness of treatment.

The very term, "effectiveness in treatment", implies all degrees of change from symptom alleviation to character change, and with the varying viewpoints of patient and physician. It had best be loosely described as treatment resulting in a change in the presenting situation of a sort to bring a degree of satisfaction to both patient and physician.

When a patient proposes to himself to consult a psychiatrist, his chances of a successful outcome of the venture depend on a variety of factors, some material, some psychopathological, some social. For all practical purposes, he should live not more than 3 to 4 hours distant from a city of 50,000 population, and preferably east of the Mississippi and north of the Potomac rivers. Psychiatrists are concentrated in cities of 1,000,000 or more, whereas almost no city of 25,000 can boast a single one.

In Maryland, for example, all sixty practicing psychiatrists work in Baltimore. There is not one of us in the whole Eastern Shore region, nor in the western counties of the State. I see no early alleviation of this situation until practicing psychiatrists overcome their distaste for professional isolation, and show a willingness to cut loose from their educational parental surrogates, the training hospitals and analytic institutes.

Provided there is a psychiatrist available, and the patient can give sufficient time and money to the cause—no small items in themselves—successful treatment rests then on the following:

First, the kind and degree of his illness. Since Kraepelin's day, notable advances have been made in our psychodynamic understanding, as translated into treatment, and in physical treatments, giving encouragement to the therapy of a widening variety of difficulties. These facts have not radically altered, however, the general conclusions reached by the Kraepelinians as to the effectiveness of treatment in the various categories of illness. Our patient then must be afflicted with an illness for which generally accepted treatments are available.

The second factor is the adequacy of the patient's motivation for treatment, or at least for its initiation. This item is crucial since private office practice rests of necessity on the patient's willingness to come. Yet I offer this criterion with the full awareness that the patient's motivation to treatment is no static matter, and its development will rest to a large extent in the physician's own hands. He must judge the immediate needs to which he may minister, and the more remote ones to whose discovery he may at the proper time direct the patient's attention.

In so many instances, the patient's approach to psychiatric treatment is

largely determined by his prior medical contacts. Each psychiatrist has his lines of medical referral. He soon learns to welcome the patient from one physician for the good preparatory job he has accomplished, and to dread the patient from another for his obstruction, conscious or otherwise, to psychiatric treatment. Here the psychiatrist has an educative job with his colleagues, for the more we can ourselves understand the various areas of responsibility, and their overlapping, the better will we lay the ground for improved collaboration. In this task nothing succeeds like success in treatment and a becoming modesty in regard to the outcome.

The patient's motivation for treatment bears some relation to his demand for results. This may or may not be verbalized, yet it remains a keystone in treatment. The patient wants his money's worth, and, in a crude but very real way, the very low average percentage of uncollected bills gives some confirmation for the assumption that this demand is being met. One might ask: Does this mean however that the psychiatrist has capitulated to the patient's conception of what he desires from treatment? In the final analysis, the patient must be the determiner of what he wants from treatment, and it is his privilege to accept or reject proffered aid. Nonetheless, it is the psychiatrist's opportunity so to present his good offices as to gain acceptance for a wider therapeutic opportunity than the patient would be able to give on the ground solely of his own conscious needs. The skilled psychiatrist will know when it is wise to accept limited goals and keep the door open to return.

The situation here is quite different from that prevailing in the hospital treatment of patients. In the latter instance, it is more difficult to assign to any one person responsibility for the results in treatment, and patient's or family's distrust or dissatisfaction with treatment is less quickly expressed in withdrawal from the treatment situation. The weight of hospital authority not infrequently serves to keep patients in hospital even though the therapeutic situation be stagnant.

The third factor of great importance is family understanding to the degree warranted by the needs of the case the family's needs and the patient's needs. This is an obligation resting squarely on the physician. There has grown up in hospital and in extramural practice an attitude best described as cold-shouldering the families of patients. The reasons for this rest on theoretical grounds of the most dubious validity, I believe. I find myself unable to sympathize with a type of psychiatric treatment which reduces the family's role to paying the monthly bill. I consider it indefensible on theoretical grounds. But beyond this it can be shown that adequate public relations in fact assist treatment and provide the therapist with an opportunity to further his own education in the extended meaning of mental illness. The growth of general understanding of our aims and

methods, and a sympathetic appraisal of society's stake in the problem can not fail to lead to a bettering of the future treatment opportunities.

To summarize the situation so far: The patient needs to be reasonably near to a practicing psychiatrist, to have time and money for the job, to have adequate motivation for treatment, and to have a minimum of family understanding and sympathy.

The fourth and most vital factor has to do with him getting into the right hands. I offer this with some trepidation and caution for my successes where others have failed are matched by my failures where others have succeeded. At least this fourth point is a pragmatic working hypothesis which benefits from a modest appraisal of the general distribution of therapeutic skills within the profession. I believe there is merit to the statement, and I shall attempt to point out some of the pitfalls and helps which may be used to get a better leverage on the matter.

The patient is in the right hands when he consults a man of maturity, with sound basic training, good clinical judgment, a therapeutic urge, with elastic therapeutic concepts, with therapeutic ingenuity, and with successful experience in the treatment of his kind of trouble.

Let us begin with the last-named criterion. The issue is more critical with the private-practicing psychiatrist than with his hospital counterpart. The latter perforce treats all kinds of patients, i.e., with all kinds of difficulties, with scant chance for specialization. The practicing psychiatrist by contrast works actively in the community, and his successes and failures are a matter of common knowledge to families and friends of his patients. In time there follows from this fact alone an increasing tendency to see for treatment purposes a narrowing range of illnesses. His own interests further this tendency, if, in fact, they are not largely responsible for the original trend. In time he becomes a specialist within the general specialty, much as a brain surgeon is a specialist within the specialty of surgery.

The trend to specialization applies not only to the interests but to the working methods, and carries with it the dangers of therapeutic rigidity, and a loss of that native curiosity which should never be absent if the best work is to be done.

The self-evaluation I have mentioned as the basis for specialization comes about from an objective view of the interests as applied to such concrete issues as the urge to active short therapy as opposed to the capacity for more passive long-term therapy; a catch-as-catch-can opportunism versus rigid rules of treatment; a preference for physical treatments versus psychotherapy, or a preference for the "hopeless cases" or for the "easy" ones (both terms loaded with booby traps). Or the choice may express such basic issues as a profound conviction in regard to the *meaning of treatment* varying all the way from an opportunity for the growth of a

meaningful personal interrelation to a technical intervention; or, from a device to achieve symptom alleviation to character change; or from an attitude summed up by "it will all finally come out in the wash", to an urgent need to see change in actual process—exhibiting antithetical attitudes toward the importance of time and the economics of the situation. The trend to specialization may begin in a chance experience, on which the physician brings his native curiosity to bear.

Nowhere is this variability of attitude better illustrated than in the recommendations for treatment in a case of classical depression. One will recommend electroshock therapy; another only supportive care and psychotherapy. In my judgment the character of the treatment relationship of patient and his family to his physician in just this sort of case has been radically altered by the introduction of electroshock therapy, and generally for the better, since it introduces a reasonable concern for the patient's financial, economic, and social welfare as well as for his psychologic welfare. We *should* be concerned about the patient's general status—in his family, in his society—for despite theoretic arguments in favor of a contrary view which seeks to negate such influences in treatment, the patient does not live in such a therapeutic vacuum, nor do we operate in one.

But even in a case of classical depression, the recommendation for treatment must take note of the *patient's need for the sense or meaning of the maneuvers*, as well as for the physician's own needs. To be specific, even when the physician has decided for electroshock therapy, he has the further responsibility for deciding if the electroshock therapy should be instituted promptly, or delayed until the patient is convinced of the physician's grasp of his problem, and then whether it should be done only in hospital or may be attempted as office treatment. The gist of all this is that whatever is done for the patient shall meet his own urge for "sense" in the procedure, and that no one item in treatment shall be expected to carry a greater load of the responsibility than it is tailored to do. The patient's sense for the adequacy of the treatment plan rests largely on his confidence in the physician. Hasty examination, hasty recommendation for treatment, even when supported with impressive statistical facts, may only lead to adverse appraisal by the patient of the physician's grasp of his problem and a lack of confidence which will end the psychiatric contact and make more difficult the next physician's efforts.

Recommendations for treatment must rest first on sound diagnosis—a term fallen into some disrepute at the hands of dynamic psychiatry in these latter years as representing the core of sterile descriptive Kraepelinian psychiatry. In the proper sense it means only the best summarizing statement of what is wrong, and envisages corrective implications.

Over the years I have come to possess a certain quick intuitive ability to

judge the kind of patients with whom I can reasonably expect to be helpful. These patients I treat. Others who come for preliminary consultation I try to turn over to colleagues whom I believe to be better fitted for the patient's special treatment needs, unless indeed my own curiosity has been aroused to the point where I wish to essay treatment in a less familiar field. I consider this an essential part of my duty to the patient, but in performing it to the best of my ability, I have encountered the greatest difficulties. For where is one to turn for any telling appraisal of self or colleague? With all due regard for the implied merits of the certification of the American Board of Neurology and Psychiatry, the insignia of the Board registration noted after American Psychiatric Association members' names in the latest directory discloses nothing in terms of therapeutic interest, rigidity or elasticity of therapeutic concepts, and therapeutic ingenuity. The American Psychiatric Association Biographical Directory is only a little more rewarding. A colleague whom you know to be an excellent therapist as judged by his interests, basic soundness of his concepts and his known results, may hide his talent under a bushel by quoting at length his meritorious contributions on "Pachymeningitis syphilitica" or "Pathology of temporal lobe tumors"—a tribute perhaps to his wide interests, or to early enthusiasms, or to his need to leave his mark in a more *exact* scientific segment than that of psychiatric treatment.

Actually in practice I have to fall back on the people I myself know about, stressing their maturity, their technical training and when possible the results actually achieved in cases I have referred to them. Otherwise I have to attempt some evaluation from the meager data at hand in the American Psychiatric Association Directories, or from inquiries from other colleagues. In Baltimore I try to know all my colleagues in practice, their interests, their working methods and their results as they care to reveal them in society discussion or in lunch-table shop talk.

I end a consultation with restatement of the patient's problem in terms of how he is bothered, some hints as to why, and suggest a treatment plan, or treatment alternatives, with suggestions as to whom the patient may better go when I consider myself not the best suited for his problem. I believe patients appreciate this honest approach.

If we ourselves have such difficulty suggesting a proper treating psychiatrist in any case, one may only feel sympathy for the patient who naively tries to find a proper psychiatrist for his own problem. Possessed of almost no governing facts, it is an insoluble problem for him and his choice must rest on chance, including the chance referral of his medical advisor.

The practicing psychiatrist will be more effective in treatment of his patients if he has access to hospital facilities for his own personal care of

them. In Baltimore we were able to demonstrate in the last six years that such opportunity makes for a saving in time and money, and to a comforting sense of continuity in treatment of great value to the patient. Patients actually leave hospital much sooner when treatment can be continued outside by their hospital physician. The situation the country over in this respect, while encouraging, as judged by Muncie's and Billings' survey of 1950, still leaves much to be desired. Many adequately trained men are still denied hospital facilities, through their complete lack locally, or through the existing hospitals being closed to them for reasons resting on historical or traditional grounds, or for other motives.

The dearth of treatment facilities had led to numerous ingenious maneuvers to circumvent the handicap, a full catalog of which is badly needed. That patient will be fortunate who falls into the hands of a physician who is not easily stymied by such handicaps, and has a gift for improvisation. For example, it seems likely that the office use of electroshock therapy came about from the rather widespread denial of hospital facilities to the practitioner. My own adventure in foster care for adults resulted from just such a situation and was a most rewarding experience for me as well as for the patients.

Over and above all these factors stand the physician's desire to help, the basic soundness of his training, including the management of his rapport with the patient as an incidental or as a major issue in treatment. But these are items of importance for all of us, not especially for the practicing psychiatrist. Unfortunately, there is no sure way to gauge the depth of the vein of human wisdom in any of us.

In general, I would submit that the practicing psychiatrist comes to judgment rather more quickly than his hospital counterpart, from the continuing operation of the law of supply and demand in a competitive situation, although the bullish character of the seller's market in which we operate at this time tends to obscure this basic fact.

To summarize: That patient will likely prosper in psychiatric treatment who has a recognizably treatable illness, and who by good fortune finds himself available to the services of a mature, well-trained psychiatrist with an urge to treatment especially of his type of illness, with good clinical judgment, and with established facilities for treatment available, or ingenuity in overcoming their lack. Impairment of any one of these items reduces the effectiveness of treatment.

REFERENCES

(1) Muncie, Wendell and Billings, E. G.: A survey of conditions of private psychiatric practice throughout the United States and Canada. Amer. J. Psychiat., *108:* no. 3, Sept. 1951.

(2) Kubie, L. S.: A pilot study of psychoanalytic practice in the United States; with suggestions for future studies. Psychiat., *13:* 227, 1951.

SUMMARY OF PAPERS XIII TO XVII

MORRIS HERMAN, *New York*

The papers divide themselves into three groups: the first on hypnosis, the next three on psychosomatics, and the last one on private practice.

In relation to the paper on hypnosis, I am impressed with the lack of knowledge of the phenomenon of hypnosis and its role in the patterns of biologic activity and its psychological significance. With this lack of basic information goes a rather meager scientific knowledge of therapeutic utility. We are ignorant of why some patients react to hypnosis and others do not. It would seem to me that more reliable criteria for judging the efficacy of hypnosis in therapy await the assembling of these basic data.

Dr. Schneck said—and I underscore this—that there is no real indication that hypnosis has favorably altered the efficacy of psychotherapy in relation to the range of beneficial response from hysteria to schizophrenia. Such lack of utility, in my opinion, accounts for the disappointment in its use and the natural atrophy in its use in therapy from Freud's time down.

In the field of psychosomatics or stress disorders, there is revealed a wide range of difference in the extent of illness included in the concept. The concept of Dr. Rosenbaum really includes all illness and reorients the point of view of overall therapeusis. As worth-while as this may be, it nevertheless represents a considerable difference from a point of view that concentrates on those bodily illnesses presumably based in a major way on tension or stress. This difference must be kept in mind at all times in comparing statistics and even methods from different workers in the field.

Furthermore, there is a tendency to assume relationships to physical illness merely because emotional or tension symptoms are present.

There is much of great value, on points of technique and management, given in the papers of Dr. Rosenbaum and Dr. Lidz. It seems to me, however, that Dr. Lidz's experience with the extent of psychotic underlay in psychosomatic patients does not parallel mine. I would agree with Dr. Rosenbaum that the actual frequency of this has not been established and has been only seldom encountered.

Dr. Lidz points out a rather fundamental problem in our therapy in this disorder, which is basic as well to many of the problems in all illnesses that psychiatrists deal with, namely, the necessity for the further clarification of the mechanisms that determine the choice of illness.

Dr. Rosenbaum discussed the goals in therapy. Unfortunately, he did not have time to deal adequately, as he did in his paper, with the six goals that he described as practical levels for the therapist to reach. I look forward to rereading them when published, as you will when you see them.

Dr. Lidz made a statement which I should like him to comment upon if time permits. He said that a major difference between the treatment of neurotic disorders and psychosomatic disorders lies in the greater care in the latter needed in making it possible for a patient to face his problems before feeling their emotional impact. I should like to know how this fits in with the concept of short-term therapy as applicable to the psychosomatic diseases.

In Dr. Wolf's paper I was impressed by the large number of patients studied. However, I am not impressed with the selection's being as unbiased as it would appear. It would seem to me that the difficulties would go in two directions. Possibly they neutralize themselves, but maybe not. I would suspect that those patients who are severely ill would tend not to be referred to Dr. Wolf's Clinic and also that those patients who are responding to other methods of therapy would not be referred. And thirdly, some intermediate factor, that would weight these figures, is that despite the fact that no advertising of selection was made, the existence of a clinic known to be neurologic or psychiatric tends to bias the referring agency in a special way to select patients with appropriate emotional disorders.

I would also point out that in the analysis of the grade of improvement or recovery in these 739 patients reported upon, it would have been of more value to have these compared with a control group consisting of patients in the same category portraying the natural course of the disease or with techniques of therapy other than those which this clinic employs.

I believe it would be an interesting experiment to utilize in some way a large body of controls that are becoming available more and more each year—that is, the large number of people who have undergone analysis or other intensive psychotherapy—and compare the incidence, types, and causes of psychosomatic or stress disorders in this group with a comparable section of the general population.

In Dr. Muncie's paper I was very much impressed by his evaluation of factors important in treatment in private practice. I was particularly pleased that he stressed the needs of the patient and especially the family of the patient. His description of our present-day attitude in therapy in relationship to dealing with the family cannot be stressed too highly. I like the term that he used, "cold-shouldering the family"—a very telling phrase but unfortunately too true.

The prescription he gives for improving our relationship with our medical colleagues, I think, is borne out by his general practical wisdom in dealing

with our medical associates, and that is a greater modesty in our expressions concerning the expectation of outcome produced in therapy. His conclusion that a therapist must be an individual with good clinical judgment, elastic therapeutic concepts, and therapeutic ingenuity, is a model of virtue which I hope most of us fit.

DISCUSSION

Dr. Henry Walter Brosin [Pittsburgh, Pennsylvania]: Since there is a great deal of interest in the problem of concomitance of psychotic disorders and psychosomatic disease, I should like to carry on with Dr. Herman's inquiry of Dr. Lidz and rephrase the question this way: is the concept of a psychosomatic disease as a defense against a latent psychosis tenable with our present information?

I would say for myself that I have personally seen and have been told by my colleagues of cases in which there is some relationship between the appearance of psychotic symptoms and the disappearance of psychosomatic symptoms, and the reverse.

Since there is a great deal of interest in maintaining dependency techniques to avoid severe symptoms, I should like to ask Dr. Rosenbaum this question: what techniques have you found most useful in maintaining dependency in psychosomatic patients who urgently need this in order to avoid the severe, acute episodes?

Dr. Milton Rosenbaum: First I wish to say that we are oriented, at this stage of our program, toward what we call increasing the functional capacity of the doctor; that is, we are working with the medical residents, by and large, in our program.

The medical man has to become aware of what his personal role is in treating these patients: that there is such a thing as the patient being dependent upon him and that giving the patient dependency support or gratifying the dependency drives does not necessarily mean that the patient is seen once a week or twice a week, but that the patient, especially in a general hospital setting (this may sound so naive as to seem silly) should at least know who his doctor is so that he can begin to develop trust and confidence in at least one meaningful person who represents medical and personal security.

Many of the residents are rather amazed when they first come into this program to have an experience in which a clinic patient will call them up on a Saturday afternoon or at odd times during the day or night. This was unheard of previously because seldom before in the history of the hospital did a clinic patient know the name of his doctor.

The medical man working with these patients often needs adequate support from a psychiatrist mainly to decrease some of his own anxiety. Also, as I tried to point out in the paper, having some realistic ideas of what the therapeutic goals are, is in itself effective in diminishing his frustration and anxiety.

The question of how we handle the dependency problem is not a simple one. With one young colored girl with an ulcer we went to the extreme of attempting to satisfy her intense dependency wishes by having the nurse on the ward "mother her" in an infantile manner. At bed time she was tucked into bed, given massages and back rubs and warm milk. We then went through a rather stormy weaning process and also had to handle the guilt produced over receiving so much. In another instance the dependency problem may be handled by seeing a patient only once every three to six months.

In answer to the question raised by Dr. Herman as to our definition of psychosomatic medicine, whether we are including specific diseases or whether we are including the whole field of medicine, I wish to say that at this time we are merely in the stage of surveying disease with some different concepts and ideas in mind, and I believe we are going to learn

some interesting things about disease in general. For instance, the patient with dermatomyositis I cited in the paper had been given up by the medical staff. If that patient had died the medical men might have believed that many of his bizarre symptoms were part of the clinical picture of dermatomyositis and perhaps might have attempted to report such new findings in the literature. However the psychosomatic approach in this case clearly revealed that the "new symptoms" and "complications" were due to the patient's emotional reaction to the illness and not specific for dermatomyositis.

Dr. Jerome M. Schneck: The point was brought up about how little we know regarding the hypnotic state itself. Well, no one knows more about how little we know than the people working intensively with hypnosis. That, nevertheless, does not affect the fact that we do obtain therapeutic results, and this is what we are concerned with here. We want to learn more about the hypnotic state, that is true, and we certainly hope that we shall be able to do so in the future.

I think that if we listen intently to some of the points brought up by Dr. Herman, we must realize that the criticisms apply not only to hypnosis but to every psychotherapeutic technic that we know of today.

I believe there may have been a misinterpretation of my comment regarding the range of disorders from the hysterical disorders through the schizophrenias. I was talking specifically about the range, not about the therapeutic effectiveness in the individual disorders themselves. I think if that point is taken into consideration, there will be a different interpretation of my comment from the interpretation that was apparently made.

Also, I noticed that there is a tendency to use the word "hypnosis" as if when we say "treatment by hypnosis", it tells you a lot. It actually tells you very little. In a recent article in the latest issue of the American Journal of Psychiatry, a comment was made that fewer additional results were obtained with hypnosis than without hypnosis. That does not mean a thing, because we do not know what specific hypnotherapeutic technics were used. It is not a matter of hypnotizing a patient and expecting some magical result to come about. You have to use specific therapeutic methods that are at your disposal plus a knowledge of psychodynamics, employing both within the framework of the hypnotic state.

Dr. Theodore Lidz: Before attempting to answer the questions, I would like to respond to some points in the various comments by saying that I do not believe that Dr. Rosenbaum and I disagree concerning definitions of psychosomatic illness. I had delimited a segment of the major topic to discuss because of the severe restrictions in the time allotted. From many discussions with Dr. Rosenbaum I believe I can say that neither of us use the term except in a very general way. In therapy both of us tend to treat all types of medical patients and do what we can to help them, rather than limit our therapeutic efforts to specific illnesses that might be classified as "psychosomatic".

Concerning the relationship of the psychosomatic disorders with the psychoses, I might say that I have not seen many persons who became psychotic under treatment, but it does occur, particularly in the treatment of such illnesses as ulcerative colitis, severe rheumatoid arthritis and severe atopic dermatitis. Efforts to adhere to a predetermined method of therapy with little modification rather than utilizing malleable techniques may well be a factor in precipitating psychoses. However, more important than the actual occurrence of psychoses during treatment, or than the observation of occasional alternation between psychosomatic illness and psychotic episodes is the personality integration of the patient. The more intensively patients with hypertension, asthma, ulcerative colitis, etc. are studied, the more one becomes impressed with the bizarre or the highly tenuous manner in which they adapt themselves to living. To a therapist who has also had experience with schizophrenic patients it is extremely puzzling why many of these patients have not become psychotic, but have managed to preserve a reasonable facade of social normality.

Dr. Morris Herman asked how concepts of short-term therapy apply to the psychosomatic disorders when great care is needed in making it possible for the patient to face his problems before feeling their emotional impact. I do not think that there is any necessary contradiction. However, it should be clear that it does not seem feasible to treat many of these patients with short term techniques. Still, as much of the therapy to the present time has been melioristic, it is often best to limit therapy. The preparation, however, may sometimes be very brief, as implied in the paper. The patient's reliance upon the physician may be sufficient; or the recognition that alternative ways of handling problems may be possible, may engender new hope and new motivation that protects the patient. Other techniques involve such maneuvers as making it possible for the patient to accept the dependency upon others that he has always been fighting against, rather than striving to overcome the patient's need for dependency.

Dr. Oskar Diethelm [New York, N. Y.]: Dr. Wolf presented a chart of various ages and diagnostic groupings and included the category of marked psychoneuroses. I wonder whether Dr. Wolf would care to state in what way the marked psychoneuroses differ from the rest of his cases. For instance, does it imply that the other patients did not have any psychoneuroses? I was not clear on it.

Then Dr. Muncie made a statement that referred to intuitive ability to judge what to expect from a patient. I wonder whether Dr. Muncie could tell us whether he has been able to analyze, in his own case, what this intuitive ability consists of.

Dr. Stewart Wolf: I am glad Dr. Diethelm asked that question, because I did not make it at all clear. The category marked "psychoneurosis" did not imply that psychoneurotic symptoms were not present in the other patients. It indicated only that they did show evidence of psychoneurosis without sufficient indication of a bodily disorder which could be classified as the others were.

May I correct one other error or omission I apparently made, Dr. Whitehorn? I did not make it clear to Dr. Herman, and perhaps not to others in the audience, that our patients are predominantly not referred. A minority of the patients in our clinic reach there because they are referred from other clinics. The clinic is not called neurological or psychiatric, but is simply one of the medicine clinics in the hospital, and the patients come directly from the outdoors. We order up a certain number of people who have symptoms that seem to indicate peptic ulcer, for example. That gateway is open, and we get them regardless of what doctors think about them.

Concerning the control groups, I hope we shall be able to do that. Possibly in this study it may be possible. But so far we have taken the first step, and I think it is a step that a good many of us could profitably take, namely, to report the results of treatment. Perhaps next time we can compare them with a control group.

Dr. Wendell Muncie: I don't think Dr. Diethelm wants me to expose myself to the public and tell why I can get along well with some and why I don't with others, but this is a common experience, I believe. Actually, I do have some ideas about it, which might take a long time to write about, and every day I am learning some more. In fact, I learned something today from Dr. Ruesch that I did not know before quite so keenly, or quite so neatly, as I do now. If I may be allowed to say so, we learn from our patients just as much as they learn from us, I am sure, and we are constantly learning about ourselves and why we get along with some and don't with others. That, I suppose, is a sine qua non for a good therapist. However, I shall talk to Dr. Diethelm privately about myself.

Chairman Whitehorn: On behalf of the Association and the Commission, I want to thank those who have presented papers this afternoon and those who have discussed and questioned them.

BIOLOGICAL, ELECTRICAL, AND PHARMACOLOGICAL TREATMENTS

Section V

CHAPTER XVIII

CURRENT EVALUATION OF INSULIN THERAPIES

JOSEPH HUGHES

Insulin therapy is currently used in psychiatry either in terms of deep or light coma or in terms of subshock reactions or in combination with electroshock therapy. In 1946 Kalinowsky and Hoch (1) reviewed the problem of shock therapy in what is now accepted as a classic monograph on the subject. The purpose of this paper is to evaluate the current status of insulin therapy in light of the clinical data accumulated in the literature since the Kalinowsky and Hoch report. To this has been added an analysis of the experiences with insulin therapy of the hospitals in the Philadelphia area, which have generously made available their clinical results for the purpose of this report. These hospitals include the New Jersey State Hospital, Trenton, New Jersey; Pennsylvania State Hospital, Norristown, Pennsylvania; Veterans Administration Hospital, Coatesville, Pennsylvania and the Friends Hospital and Pennsylvania Hospital, Philadelphia, Pennsylvania.

This evaluation is primarily concerned in attempting to seek out, in terms of factual data, those correlations assumed to exist between the specific procedure of giving insulin and its therapeutic effectiveness and secondarily, with the attempt to discover not only the prognostic criteria for treatment but to determine the relative effectiveness of deep coma therapy and combined deep coma insulin and electroshock therapy. There was insufficient data in the literature to make a comparison of the respective effectiveness of light coma or subshock insulin with deep coma therapy.

The clinical results obtained with insulin as reported in the literature are in agreement if one compares the various reports according to similarity of diagnostic criteria and therapeutic procedures; they show their widest disagreement as the patient groups differed in terms of selection or in differences in therapeutic procedures. There is agreement throughout the literature that higher ratios of therapeutic success are obtained as insulin therapy is administered early in the course of the disease. There are differences, as to the role played by other factors, such as the type of schizophrenia in terms of paranoid, hebephrenic, catatonic and other types

of schizophrenia, age of patient, length of treatment, dose of insulin, number of coma days, significance of convulsive seizures and in indications for combined treatment with electroshock.

The hospitals in the Philadelphia area, largely due to the guiding interest of Bond and his associates at the Pennsylvania Hospital, have employed comparable diagnostic criteria for selection of patients for treatment as well as similar techniques for administration of deep insulin coma therapy. A review of the clinical experience of these several hospitals offers an opportunity to study the effect of deep coma insulin therapy on a relatively good sample of patients. These results will be considered in comparison with the results reported in the literature.

The clinical data reported in the literature since 1946 from papers appearing in the American Journal of Psychiatry, The Archives of Neurology and Psychiatry, The Journal of Nervous and Mental Disease, The Psychiatric Quarterly and Progress in Neurology and Psychiatry, show a combined total of 748 patients reported upon by various authors (2–6) as having been treated with deep insulin coma therapy. The results reported from this group of 748 patients showed 501 (67 per cent) patients as having recovered or made an improvement while 247 (33 per cent) were unimproved. These figures represent data on groups of patients and therapy that differ somewhat from each other either in terms of diagnostic criteria or in some details of treatment. These results are 15 per cent better than those reported by the hospitals in the Philadelphia area. In the Philadelphia group of 686 patients, which was selected in terms of more uniform diagnostic criteria, 360 (52 per cent) recovered or improved and 326 (48 per cent) were unimproved following treatment with deep insulin coma therapy. The diagnostic criteria in the Philadelphia group of patients were defined so as to select patients ill with schizophrenia with the same clinical severity. This group of patients was made up of individuals suffering their first schizophrenic break and treatment was instituted within the first year of illness.

Follow-up studies made on 107 patients 6 to 18 months after therapy, at the Norristown State Hospital, showed 46 patients (43 per cent) holding their recovery while an 18-month follow up on 145 patients treated at the Veterans Administration Hospital, Coatesville, Pennsylvania showed 56 patients (39 per cent) holding their recovery. At the Pennsylvania Hospital 309 patients (37 per cent) held their recovery in the follow-up studies over a period of 5 years (table 8).

It apparently is the common practice, as judged by the results in the literature and the individual psychiatric hospitals, to combine electroshock therapy with deep insulin therapy if patients are not making satisfactory clinical progress with the insulin therapy alone. It is also common procedure to start combined therapy by the 6th or 7th week of insulin therapy. An

average course of therapy with insulin may be said to be 10 weeks, as judged by the reports in the literature.

The literature offers a group of 561 patients treated (3, 4, 6–8) with combined deep coma insulin and electroshock therapy. Of these 385 patients (69 per cent) recovered or improved and 176 patients (31 per cent) showed no improvement. The experiences of the hospitals in the Philadelphia area with combined deep insulin coma and electroshock therapy reveal that out of a group of 1574 patients treated, 914 patients (58 per cent) were able to be discharged from the hospitals back to the community. This represents both the recovered and improved patients. 660 patients (42 per cent) showed no improvement. Follow-up studies showed that 271 patients (30 per cent) of this group of 914 patients had a recurrence of their clinical symptoms within 18 months of their discharge and were readmitted

TABLE 8

Deep coma insulin therapy

NO. PATIENTS	RECOVERED	UNIMPROVED
748	501 (67%)	247 (33%)
686	360 (52%)	326 (48%)
Follow-up results		
107 (Norristown)	46 (43%)	6–18 months
145 (Coatesville)	56 (39%)	18 months
309 (Pennsylvania)	114 (37%)	5 years

to hospitals. This left 643 patients (41 per cent) out of the 1574 patients treated who have maintained their recovery as judged by their ability to maintain their lives in the community outside the hospital for more than 18 months. The mortality rate from the hospitals in the Philadelphia area as calculated from the number of deaths of patients under treatment either with deep insulin therapy or combined deep insulin coma and electroshock therapy is 0.4 per cent (table 9).

Cohen (9) has recently analyzed factors which have been formerly cited as having prognostic significance in insulin therapy in an excellent statistical survey on his group of 639 patients at the Veterans Administration Hospital, Coatesville, Pennsylvania. Cohen's data indicates that patients ill less than one year have twice the recovery potential of those sick longer than a year, also the response to insulin therapy decreases with the age of the patient by increasing the length of time ill. His data also indicate that a weight gain of 30 pounds is a most favorable prognostic sign and the statement is made that patients who gain more than 30 pounds do almost

twice as well as those whose weight gain is under 30 pounds. Cohen equates this observation with the common clinical finding that patients who give a history of weight loss immediately prior to the onset of the psychosis have a known tendency for a greater potential for recovery. This data suggests that there is a causal relationship in terms of prognostic significance in the patient's loss of weight prior to illness and increasing weight with insulin therapy. Providing that treatment days range between 40 and 60 and total hours of deep coma between 15 and 35 the response to therapy is independent of increased treatment days or increased number of coma hours. Likewise the response to therapy is independent of the average daily dose of insulin provided sufficient is given to produce the required number of coma hours (15 to 35) and the required number of coma days (35 to 55), nor was the response to therapy able to be correlated in terms of statistical values with the somatotype or the diagnostic type of schizophrenia with

TABLE 9

Combined deep coma insulin and electroshock therapy

NO. PATIENTS	RECOVERED	UNIMPROVED
561	385 (69%)	176 (31%)
1574	914 (58%)	660 (42%)
Follow-up studies		
914	643 (41%)	18 months

Mortality rate—deep coma insulin and combined deep coma insulin-electroshock: 0.4%.

the exception that the paranoid type seemed to do slightly better than average and the hebephrenic type slightly less well. There is a trend to poor response with increasing age of the patient.

The complete evaluation of insulin therapy is dependent on adequate and long range follow-up studies. In this regard it should be mentioned that of 309 schizophrenic patients treated at the Pennsylvania Hospital (2) 48 per cent recovered or improved at the time of treatment and 37 per cent were still recovered at the end of five years. The recovery and much improved rate without insulin therapy at the same hospital was 16 per cent. Other follow-up studies made 2 to 4 years after treatment with deep insulin coma show recovery rates varying from 33 per cent (10) to 37 per cent (11). Another five-year follow-up study (12) showed a 53 per cent recovery rate which according to studies by the same authors is only 9 per cent greater than the spontaneous recovery rate in their control group of untreated patients. In contrast are the results of a six-year follow-up study (13) which showed a 25 per cent recovery rate.

Insulin is a physiological and pharmacological method of treating schizophrenia. The clinical and experimental evidence indicates that whatever action it has on schizophrenia is primarily due to the inherent capacity of insulin to bring about physiological responses. This does not deny the existence of adjunct psychological factors developing out of the patient's reaction to this procedure.

There have been no new major developments in our understanding of how insulin achieves its effect. Correlative studies have appeared in the literature as to the production and effect of ACTH (14) following insulin therapy and its relationship to clinical changes. There have been some studies published on the role played by glutamic acid (14) in response to hypoglycemia. There has also been speculation that insulin produces a stress response and the effectiveness of insulin in bringing about clinical changes in a patient's condition occurs as part of the total body changes and is best explained in terms of the general adaptation syndrome.

Since the introduction of insulin shock therapy there seems to have been sufficient time since 1933 for the accumulation both of hospital and personal experience among the individual psychiatrists concerned with this form of treatment to permit certain deductions. Yet an adequate evaluation of the accumulated data on insulin therapy is not available because of lack of uniformity in the criteria of the data used in these analyses. Even at this time there is much to be desired for proper statistical analyses. Thus the figures presented in this paper still remain largely a personal opinion arrived at on the basis of percentage of recoveries in heterogeneous material and includes an appreciable factor of subjective interpretation. It is still not possible to evaluate with objective certainty whether insulin therapy as such affects the schizophrenic process itself or merely hastens the recovery that could occur spontaneously over a more prolonged period of time. The 5-year follow-up studies of Hinko and Lipshutz (12), which have previously been considered, showed relatively an insignificant difference between insulin treated patients and a control group of patients treated by other methods.

At present it may be said that insulin is a useful therapeutic procedure and is one of the major resources that the psychiatrist has at his disposal in treating schizophrenia to shorten the length of hospitalization. The accumulated data indicates that insulin by itself cannot be regarded as a specific for schizophrenia but it represents one of the major attacks on this disorder. At the present time insulin therapy should not be divorced from psychotherapy or the other therapeutic procedures carried out in a psychiatric hospital which are designed for the purpose of reconstructing better and more satisfactory interpersonal relationships for the patient. The potential factors for recovery or for illness in schizophrenia have not as

yet been clearly identified or defined. To the degree that the potential for recovery could be clearly separated out from the potential for illness one could have a probably better understanding of the prognosis in any single given patient. When the potential for recovery (if it can be found within the patient) is high, insulin therapy will be extremely successful; when the patient's potential for recovery is low the results will be disappointing.

REFERENCES

1. Kalinowsky, L. B. and Hoch, P. H.: Shock Treatments and Other Somatic Procedures in Psychiatry. Grune and Stratton, New York.
2. Bond, Earl D. and Shirley, Jay T.: Insulin therapy and its future. Amer. J. Psychiat., *103:* 1946.
3. Niver, Edwin O. and Catlin, Karl A.: Experiences with mixed insulin and electroconvulsive therapy. Psychiat. Quart., *213:* 1947.
4. Paster, Samuel and Holtzman, Saul C.: A study of 1000 psychotic veterans treated with insulin and electric shock. Amer. J. Psychiat., *105:* 1949.
5. Gottlieb, Jacques S. and Huston, Paul C. Treatment of schizophrenia. J. Nerv. & Ment. Dis., *113:* no. 3, 1951.
6. Holt, William J., Jr., Landau, David and Vernon, Taylor: Insulin coma treatments of schizophrenia compared with electric coma treatment of patients on subshock insulin. J. Nerv. & Ment. Dis., *112:* no. 5, 1950.
7. Horwitz, William A. and Kalinowsky, L. B.: Combined insulin coma and electric convulsive therapy in schizophrenia. Amer. J. Psychiat., *104:* no. 2, 1948.
8. Paster, Samuel and Holtzman, Saul C.: Experiences with insulin and electroshock in an Army general hospital. J. Nerv. & Ment. Dis., *105:* no. 4, 1947.
9. Cohen, Max: Analysis of prognostic factors in insulin therapy. Arch. Neurol. & Psychiat., *66:* no. 4, 1951.
10. Bond, E. D. and Rivers, T. D.: Further follow-up results in insulin shock therapy. Amer. J. Psychiat., *99:* 1942.
11. Ross, J. R. et al.: Pharmacological shock treatment of schizophrenia. Amer. J. Psychiat., *97:* 1941.
12. Hinko, Edward N. and Lipshutz, Louis S.: Five years after shock therapy. Amer. J. Psychiat., *104:* 1947.
13. Gralnick, Alexander: A seven year survey of insulin treatment in schizophrenia. Amer. J. Psychiat., *101:* 1945.
14. Spiegal, Ernest: Progress in Neurology and Psychiatry, Vol. 6. Grune and Stratton, New York, 1951.

CHAPTER XIXa

CURRENT EVALUATION OF ELECTRIC CONVULSIVE THERAPY

Correlation of the Parameters of Electric Current with Physiologic and Psychologic Changes

W. T. LIBERSON

INTRODUCTION

Since Cerletti and Bini (11) established the "classical" technique of electric shock therapy, several investigators have questioned the wisdom of using directly the domestic alternating current for this purpose. Delmas-Marsalet (14–17) first, and then, independently and almost simultaneously, Friedman and Wilcox (19) considered that the main disadvantage of these currents was the diphasic oscillation of the electrical potential. They therefore recommended the use of a rectified pulsating (or "unidirectional") current without having submitted this problem to a comparative physiological analysis. Hemphill and Walter (28) studied the relationship between the threshold for 60-cycle current and the total time of its application ("treatment time"); later Toman and Goodman (75) extended their observations. Liberson (42–48) submitted different time factors of electrostimulation (pulse duration, pulse frequency, treatment duration) to familiar physiological methods of analysis, abandoning empirical trials of "reforming" the domestic current for the purpose of electrostimulation of the human brain. Offner (61) published a theoretical study of the form of the pulsating current. From these different investigations emerged a concept of total-versus-dissociated seizure responses, with motor, autonomic, endocrine, and mental components selectively susceptible to different parameters of stimulation. Various subconvulsive, convulsive, and supraconvulsive reactions were described (5–8, 14–17, 78–83, 42–48, 75, 29–31, 2, 3) in animals and man. Techniques of "milder" versus "conventional" forms of therapy, applied separately or in combinations were established. The advent of Brief Stimulus Therapy, which has proved its therapeutic value (48, 24, 25, 56, 57, 37, 22) made it possible to apply not only subconvulsive and convulsive therapy, but also supra- and post-convulsive stimulation, with apparently different psychophysiological and therapeutic results than in the case of the conventional electronarcosis (21, 72–74).

However, the great majority of psychiatrists still limit themselves to the use of the conventional Cerletti-Bini technique. The time has come to pause for an experimental and clinical revaluation of the psycho-physiological problems related to the use of different parameters of the stimulating current. For this purpose we shall consider 1) analytical studies of different parameters of the stimulating current; 2) a comparative study of their psycho-physiological effects; and 3) an attempt at a synthesis on both experimental and clinical grounds.

ANALYTICAL STUDIES OF THE CONVULSIVE CURRENT

A convulsion cannot be produced by a single physiological stimulus. Several stimuli must be applied in succession in order to produce a summated effect. One must therefore consider at least the following parameters of stimulation (fig. 8):

a) Individual pulse of the stimulating current: its intensity ("peak current"), its duration, its form, and its being either uni- or bi-directional.
b) Frequency of repetition of individual stimuli, with or without secondary interruption of the stimulating current.
c) Total duration of the stimulation ("treatment time").

The concept of summation introduced in physiology by Sechenoff (1868) is relatively easy to submit to an experimental analysis when the stimulus is applied directly to the cell where the stimuli are being summated. This is the case of the latent addition of Richet which was described and analyzed in the case of a slow muscle (36). Here each successive stimulus results in a twitch of progressively higher amplitude due to the summated "quanta" of excitation produced by each pulse of the current. The process of summation is much more complex when central nervous structures are stimulated. Here the presence of reverberating circuits does not permit an easy differentiation between the direct effects of the stimuli and those elicited by "self-sustained" and "self-propagated" reactions (65). The "spatial" summation superimposes upon the temporal one in an as yet poorly understood manner. Figure 9 illustrates the mode of propagation of the afterdischarges leading to a major convulsion produced by an electrical stimulation of the premotor cortex, the electrodes being applied directly to the premotor and anterior frontal cortices (see also 58). Different anatomical structures of the brain contribute in a diversified way to the summated effect and may not require the same optimal characteristics of stimulating current. For instance, a recent study of non-epileptic patients submitted to cortical undercutting stressed the epileptogenic sensitivity of the uncus, the strength-frequency relationship being quite different from that determined by transcranial stimulation (50, 23). Jung (35) observed an electrical activity in the rhinencephalon during pauses of the electrical response recorded from the cortex while the animal exhibited a clonic phase.

Because of this complexity, it is helpful to consider first a process of "temporal summation" entirely dependent upon the stimulating current, being fully aware of the presence of a great number of superimposed processes eluding as yet a functional analysis.

Figure 10 gives a schematic representation of what may happen during a simple temporal summation. One may assume that the threshold level is achieved if a certain process reaches

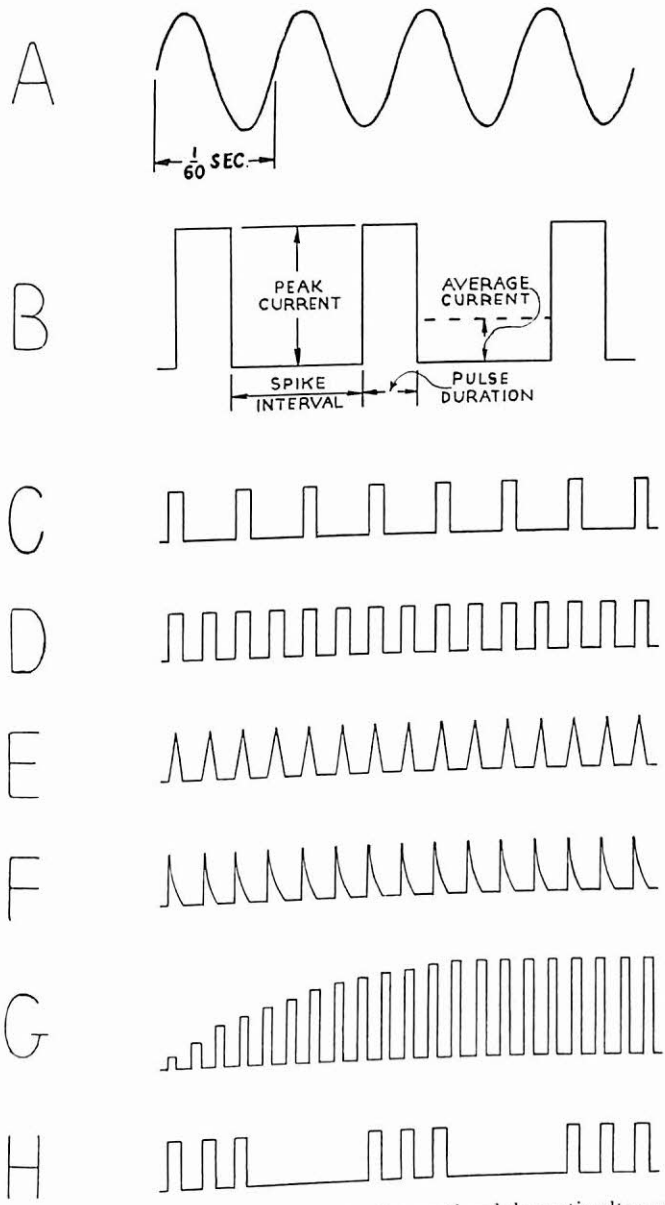


Fig. 8. Illustrates various types of current. A: Conventional domestic alternating current. B: Square waves of relatively long duration and slow frequency. C: Square waves of briefer duration and faster frequency than in B. D: Brief stimuli of the same pulse duration as in C, but of faster frequency. E and F: Brief stimuli of the same frequency as in D, but of different form. G: Brief stimuli with a "glissando" onset. H: Groups of brief stimuli separated by periods of "silence" (secondary interruption of the current).

the horizontal line $T-T_1$. Such a process may include depolarization of a membrane, or a chemical reaction leading to the liberation of a "mediator", etc. One may assume, on the other hand, that no matter how strong the available individual stimulus may be, the amplitude of the changes it produces can never reach this level, although it will produce a certain change in the right direction. If a second stimulus arrives after a certain interval, it will produce an

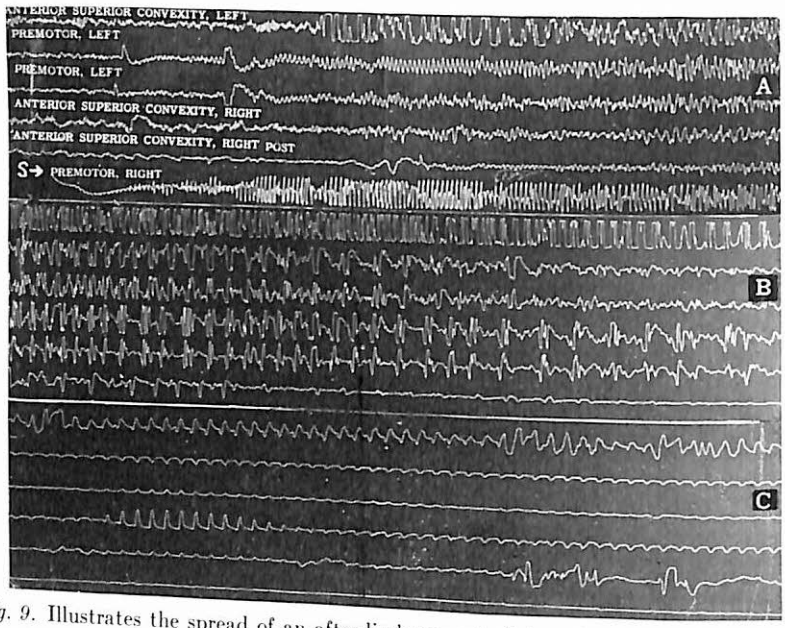


Fig. 9. Illustrates the spread of an afterdischarge set off by stimulation of the right premotor area and resulting in a convulsion in a non-epileptic patient undergoing a craniotomy under local anesthesia. This record was made in collaboration with Dr. Charles Henry and Dr. Benjamin Whitcomb.

A: The spread of the afterdischarge to the contralateral premotor area, then to the contralateral superior convexity, and finally to the ipsilateral superior convexity (anterior before posterior).

B (taken 40 seconds after A): The cessation of afterdischarge first in the stimulated area, then in the contralateral premotor area, the afterdischarge remaining most intense in the contralateral anterior superior convexity (in its posterior portion). There is also afterdischarge of a lesser intensity in the ipsilateral superior convexity.

C (taken 40 seconds after B): A flattening of the record over most of the cortex, particularly over the stimulated area, with remaining afterdischarge in the contralateral anterior superior convexity.

Stimulating current: pulse duration 10 milliseconds; frequency 50 per second; "treatment time" 5 seconds; voltage 6 volts.

additional excitation in the same direction. The degree to which both changes summate depends upon the result produced by each stimulus and also upon the magnitude of the remaining change produced by the first stimulus at the time of the arrival of the second. Indeed, the change produced by a single stimulus does not remain at a constant level; it may follow a curve, with a rapidly-ascending onset and a slowly descending terminal portion. There will be an optimum interval when the summation is at maximum. If the second stimulus arrives later

on, the efficiency of summation will be decreased; and if the second stimulus is delivered after too long an interval, no summation will occur. The degree of summation will therefore depend not only upon the amount of change produced by each stimulus, but also upon the rapidity of the dissipation of this change and upon the interval of time which separates two successive stimuli.

All these factors may be such that the combined results of a double stimulation will make the process of excitation reach the desired level. In many cases, however, and particularly in those when a threshold stimulation is used, more stimuli will be needed before the level is reached. In other words, the degree of summation will depend not only upon the characteristics of the individual stimulus and the frequency of repetition of these stimuli (interval), but also

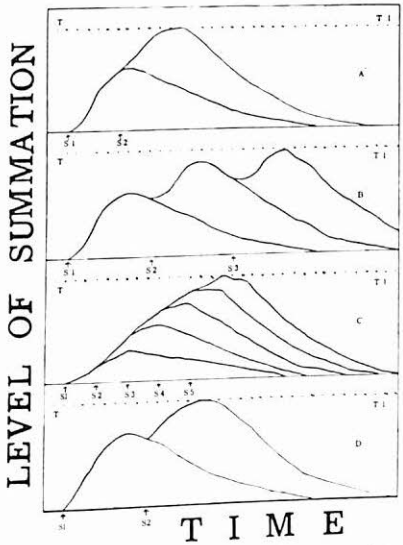


Fig. 10. Schematic representation of the process of summation of "quanta" of excitation before the threshold (T–T_1) is reached. A: Summation obtained after application of 2 stimuli. B: The same summation obtained with a longer total time of stimulation than in A, but with a decreased frequency of stimuli. C: Same summation obtained with a shorter total time of stimulation but with an increased frequency of stimuli, each of them being of lower intensity. D: Same level of summation obtained with only 2 stimuli having the same interval between them as in B, but utilizing stimuli of higher intensity.

upon the total time of stimulation. Inspection of figure 10 shows that summation increases with the increased effect of each stimulus, with increased frequency of stimulation (up to a certain limit, which will be an optimum frequency), and with prolonged time of stimulation (also up to a certain limit). It may also be seen that, to a certain degree, all these factors are interchangeable. For instance, slowing the frequency of stimulation may be compensated for within certain limits, by prolongation of the total time of stimulation. Moreover, an increase of the effect of each stimulus will permit the use of either a slower rate of stimulation or of a shorter total time of excitation before the given level is reached.

The presence of reverberating circuits and of the progressive involvement of different brain structures in the convulsion-producing mechanism makes the curves related to each quantum of excitation more complex and of variable time constant as the excitation progresses, but the fundamental pattern of summation remains essentially similar.

We may therefore consider the three following main factors of temporal summation: 1) effect of each stimulus; 2) frequency of repetition of stimuli; and 3) total time of stimulation.

Effect of each stimulus

The effect produced by each stimulus depends essentially upon two factors, the strength of the stimulus, and its duration.

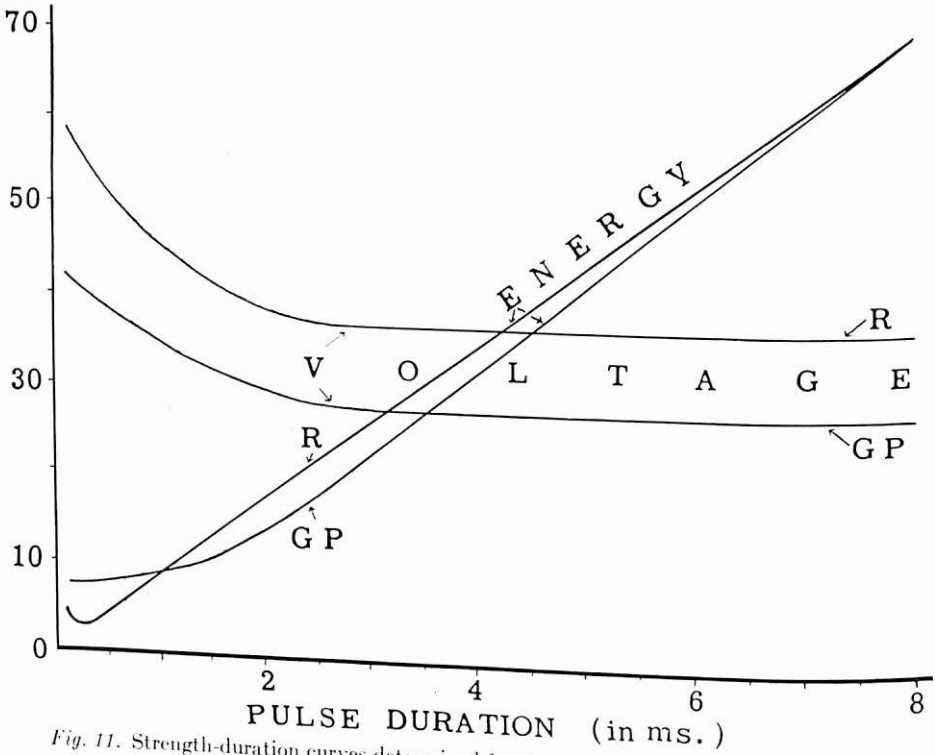


Fig. 11. Strength-duration curves determined for the convulsive threshold (R) in a rabbit, and (GP) in guinea pigs (each point is an average value based on 5 pigs) using a total time of stimulation of 0.5 seconds and frequency of stimulation 80 per second and 60 per second respectively. Voltage and energy are expressed in arbitrary units. Energy is calculated according to the V^2T formula.

The *strength* of the stimulus may be expressed either in volts (peak) or better in milliamperes (peak), measured from the origin to the top of the stimulus. A specially calibrated meter should be used for this purpose.

The importance of the *duration* of each stimulus ("pulse duration") may be best analyzed by examining the "strength-duration curve". Such curves have only recently been investigated in relation to the convulsion-producing current (43). Prior to these studies, only fragmentary and contradictory data were available concerning the electrical stunning (not

convulsions) in dogs (32), and the maintenance of electronarcosis (not eliciting of it) (76).

Figure 11 shows strength-duration curves determined respectively on guinea pigs and rabbits when the total time of stimulation and the frequency of stimulation remained unchanged. The chronaxie suggested by these curves is below 0.5 milliseconds, possibly 0.2 to 0.3 milliseconds. These curves suggest that after an initial period of 2 milliseconds the stimulating pulses do not contribute to the excitation.

If electrical energy is considered instead of voltage, the optimal conditions of stimulation are realized below 0.5 millisecond. The duration of each cycle of alternating current used in conventional techniques is of 16 milliseconds; the pulse durations used in the original unidirectional method of Friedman and Wilcox are of the same order; in other words, they are 20 to 30 times longer than the optimal values with which tonic-clonic convulsions could be elicited in animals. This was confirmed in patients (52) and gave rise to the development of the Brief Stimulus Therapy (BST) (42–48). It has been confirmed by all investigators working in this field (4, 75).

Frequency of repetition

When domestic alternating current is used, the frequency is of 50 to 60 per second and is pre-determined by the pulse duration. When condenser discharges, or square pulses, are used the frequency of repetition of stimuli and their duration may be independently changed.

The problem of the optimum frequency of stimuli applied to the cortex has received more attention in physiological laboratories than the question of pulse duration. Adrian reported data on the cortex of the rabbit and cat where the phenomena of facilitation were observed with as low frequencies as 10 to 30 per second (1). In both cases, the animals were under dial anesthesia. According to Noel (60), the durations of epileptic discharges recorded on cortex of the cat are the longest for a frequency of about 30 per second. According to Boynton and Hines (9), Dusser de Barenne and MacCulloch (18), motor responses could be obtained with optimum frequency of 60 per second. Wyss and Obrador (84), working on monkeys under dial, found that the optimum frequency is variable according to the region of the cortex stimulated and averages 25 per second.

Our data on electrically produced convulsions in guinea pigs and rabbits, using a pulse duration of 0.3 milliseconds, showed considerably higher values of optimal frequencies, at least 250 per second (43). The voltage increased as the frequency decreased below 100 per second. In these experiments, the lowest frequency studied was 60 per second.

Arieff (4) found the lowest threshold current for 300 per second stimulation with a pulse duration of 1 millisecond and for 200 per second with a

pulse duration of 0.2 millisecond. He stated that the threshold increased above a 10-millisecond interval (below about 100 per second stimulation) when many animals did not respond even when the current was increased 2 to 3 times its value for the optimum frequency.

Figure 12 shows, besides the voltages, the values of computed energies for different frequencies. One can see that the energy remains relatively constant for frequencies above 100 per second (it increases slightly with

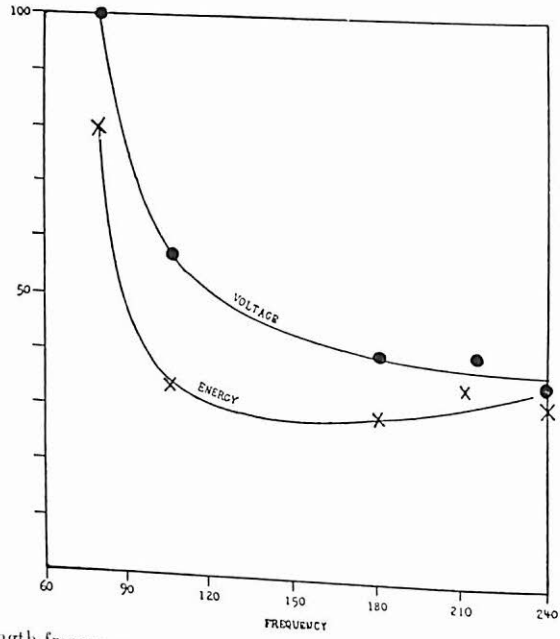


Fig. 12. Strength-frequency curve determined on 2 rabbits. Each point corresponds to an average of several determinations made on both animals. Energy is expressed in arbitrary units according to the V^2T formula. The duration of each stimulus and the total duration of stimulation were constant (respectively, 0.3 millisecond and 0.5 second).

increasing frequency above this limit), but it rises more sharply below 90 per second.[1]

Grouping of stimuli. The optimal frequency of stimulation must be related to the time constants of processes which are involved in the summating excitatory events. As there may be a superimposition of such processes, the total summation curve may be a complex one, each of its components having a different "time constant". For instance, in the case of spinal

[1] The optimal pulse duration and frequency should be determined for comparable convulsive reactions as they may be different, for instance, if one seeks a simple jerk or a typical tonic-clonic response. Some of the components of the total electroshock pattern may be elicited by different frequency or pulse durations. Thus the respiratory response obtained by stimulation of either the orbital surface (53) or uncus (50, 23) may be characterized by slower optimal time-constants than are the motor reactions.

reflexes of the frog, Bremer (10) found several peaks in the summation curves. Thus the summation of two supramaximal stimuli could be observed at three different optimal intervals, 1.5 to 2 ms., 8 ms., and 60 ms. (corresponding respectively to 500, 120, and 17 per second stimulation). He suggested the presence of three different locations of summated processes with distinct pharmacological affinities. To these three different mechanisms, one could add at least a fourth one, as we found (40, 41) that the spinal reflexes of the toad show two preferential total times of summation, one of 0.5 seconds and one of 5 to 10 seconds, when 10 per second stimuli are used. If analogous mechanism were present in the case of a cortical convulsant stimulation, an optimal stimulating current could consist of groups of stimuli (pairs, triplets, etc.) (45) very closely spaced (at 1 to 2 ms. intervals) repeated at a frequency of about 100 per second, and secondarily interrupted about 10 to 15 times per second. The possibility of the summations of effects of a repetitive stimulation after an interval of 2 seconds is illustrated by the following observation:

Mrs. O., 37 years, involutional melancholia

2-3-47	Peak current	425 ma.	
	Pulse duration	0.7 ms.	No convulsion
	Total duration	0.5 sec	
2 seconds later	Peak current	425 ma.	
	Pulse duration	0.7 ms.	Major convulsion
	Total duration	0.5 sec.	
2-10-47	Peak current	475 ma.	
	Pulse duration	0.7 ms.	No convulsion
	Total duration	0.5 sec	
2 seconds later:	Peak current	475 ma.	
	Pulse duration	0.7 ms.	Major convulsion
	Total duration	0.3 sec	

These conditions justify the use of a secondary interruption of the electroconvulsive current. Wilcox (81) considers that the mechanism of the "summation in cascade" which we suggested (48) may be the basis of the effectiveness of the currents used by him.

Total time of stimulation ("treatment time")

This third factor of summation was investigated by several workers. Hemphill and Walter (28), using 60 cycle current, demonstrated a continuous decrease of threshold current with increase of total time of stimulation within the limits they investigated. These limits were extended in subsequent studies on animals by Toman and Goodman (75). These investigators also used the domestic current and explored treatment times from 0.2 to 10 seconds in rabbits, cats, and monkeys. The results were strikingly similar in all the species, showing a continuous descrease of the stimulating threshold current as the treatment time increased. The energy appeared relatively constant but minimal for brief periods of stimulation. In our research on man with 120 per second brief stimuli (0.5 to 0.7 milliseconds), analogous results were obtained. A slight tendency for minimal energy was observed for a duration of 1 second, but the differences between 0.5,

1 and 1.5 seconds did not exceed 15 per cent in so far as the energy was concerned. The voltage used with a total duration of 1.5 seconds was almost half the voltage required when the stimulation lasted only 0.5 seconds (fig. 13). These results suggest, therefore, that the total time of stimulation might be as long as can be tolerated by the patient, provided, of course, that the therapeutic results remain the same.

From the theoretical point of view, these results clearly indicate exceedingly well-developed potentialities in the cortex for summation of stimuli, the effect of which may increase over periods of the order of a minute, sometimes even more, without the presence of external stimuli.

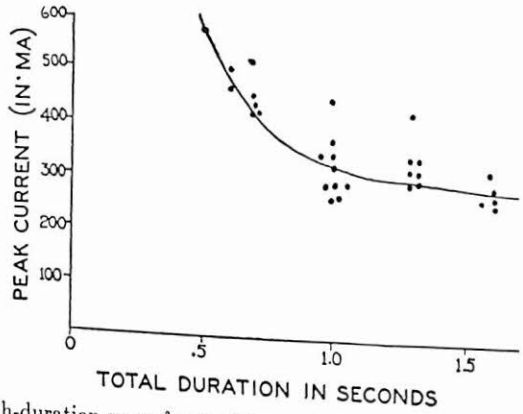


Fig. 13. Strength-duration curve for total times of stimulation; 31 patients. Pulse durations were of 0.5 to 0.7 millisecond.

Total energy requirement

The energy requirement when brief stimuli (0.5 to 0.7 ms.) with a relatively high frequency of repetition (120 per second) are used over a relatively long period of time (1 to 2 seconds) is much lower than with either the conventional techniques or the original Friedman-Wilcox method (52). This latter comparison was made under the same conditions of application of electrodes (vertex-temporal), with the same patients, and with the same frequency of stimulation and treatment time (0.6 to 0.7 seconds). Threshold energy with the Friedman-Wilcox technique was 3.60 watt-seconds and with the BST, 0.46 watt-seconds, about 8 times less. In bi-temporal application of BST, with a total time of 0.6 seconds, a peak current of 500 milliamperes, and 120 stimuli per second, a convulsion could be produced with 5 watt-seconds as against 25 watt-seconds with the classical technique. At times, 600 milliamperes are needed with a treatment time of about a second. Even if stimuli of 0.7 milliseconds are used, the total energy still remains below the requirements of the classical technique.

In most of the experiments, vertex-temporal position was used, as with this location of the electrodes only 75 per cent of the peak current is needed and the energy requirements are at most only half as high as with bi-temporal application.

It is important to note that the average threshold current is a function of age as table 10 shows (with vertex temporal position of the electrodes).

TABLE 10

AGE	TREATMENT DURATION	PULSE DURATION	PEAK CURRENT
yrs.	*sec.*	*ms.*	*ma.*
15–19	1.3	0.5	250–300
20–24	1.3	0.5	300–325
25–29	1.3	0.5	325–350
30–34	1.3	0.5	325–350
35–39	1.3	0.5	350–375
40–44	1.3	0.5	375–400
45–54	1.3	0.5	400–425
55–59	1.3	0.5	425–450
60–70	1.3	0.5	450–

PSYCHOPHYSIOLOGICAL EFFECTS OF STIMULATION

Previous sections summarized the initial experimental data concerning the influence of the parameters of the excitatory current on the threshold energy of the effective stimulation. The threshold energy could be considerably decreased by use of (a) brief stimuli instead of long impulses of alternating or direct pulsating currents, (b) higher frequency of repetition of individual pulses; and (c) prolonged treatment time. All these factors should be analyzed separately in regard to their effects upon the physiological and psychological changes produced by the current. Unfortunately, since the conditions of clinical psychiatry do not permit such an analytical investigation, the various parameters of current were combined, thus preventing the possibility of evaluating them separately. The situation is complicated by the fact that the location of electrodes influences both the threshold energy of the stimulating current and its psycho-physiological effects. Thus, the bi-parietal or vertex-parietal position of electrodes requires a lower intensity of stimulation than the usual bi-frontal or bi-fronto-temporal position (19, 27).

One has been accustomed to considering convulsion in terms of all-or-none response, despite daily clinical observations of the extreme diversity of the manifestations of epilepsy. The following data show that a change in the time factors of stimulation permits the modification of some of the essential features of the electroshock. Most of the quantitative informa-

tion was obtained with the following techniques:

a) Classical technique. With a short treatment duration (0.2 to 0.4 sec.), high amplitude alternating (60 per second) current, bi-fronto-temporal electrodes.

b) Brief stimulus therapy. Pulse duration of 0.5 to 1.0 milliseconds, total duration of 1 to 2 sec., vertex-temporal or bi-fronto-temporal stimulation.

However, partial information is available concerning:

c) The technique of Delmas-Marsalet, with "unidirectional" pulsating current (long pulse duration, short treatment time) (16).

d) The original Friedman-Wilcox "unidirectional" technique long pulse duration, long treatment time (19).

e) "Unidirectional currents" comprising brief stimuli ("spikes") of variable duration delivered at high frequencies instead of long smoothed half-sine waves (80–83).

f) Alternating current, 60 per second, with a prolonged treatment time.

g) Brief stimuli with a very prolonged treatment time.

Before describing the comparative effects of techniques (a) and (b) and referring to the available information concerning the others, we shall summarize the concept of *levels* of sub-convulsive, convulsive, and supra- or post-convulsive stimulation introduced by Delmas-Marsalet (technique (c)) and Hirschfeld (technique (f)) (29–31). Toman and Goodman partially described analogous phenomena in animals (75).

Levels of stimulation obtained with direct pulsating current of progressively increasing intensity (16):

1st degree (lowest current)—emotional reactions; muscle contractions without convulsion.

2nd degree—"petit mal" reaction (loss of consciousness) without apnea; emotional reactions; muscle contractions.

3rd degree—"petit mal" (loss of consciousness) with apnea; emotional reactions; muscle contractions.

4th degree—"petit mal" plus tonic contractions; emotional reactions.

5th degree—typical tonic-clonic convulsion following the emotional reactions; loss of consciousness; apnea; convulsion followed by stertorous respiration.

6th degree (highest current)—supra-convulsion after a shorter latency time, the other phenomena remaining the same.

Recently Hirschfeld and Bell (31) described four levels of stimulation with BST (presedation with pentothal was used):

First stage (peak current 80 milliamperes: pulse duration 0.3 milliseconds; 120 per second; average current 2 milliamperes). Patients are relaxed, breathing quietly and exhibiting a marked autonomic response.

Second stage (same parameters of current but peak amplitude 250 ma. and average current 10 ma.). Respiration is suppressed and the patient exhibits a rigidity of "decorticate" type. Autonomic response is at maximum.

Third stage (same parameters of stimulation except that the peak intensity is about 450 ma.; average current 15 ma). Grand mal is produced, followed by rigidity. If the electrodes are shifted forward, respiration is stimulated. Tonic contraction develops progressively without an initial jolt. The clonic phase may be suppressed by maintaining the current at about 400 ma. peak. Alexander (2) believes that this phenomenon is due to a true suppression of clonic

movements and is not just a masking of them by a superimposed tonic contraction. We may add that if the pulse duration is excessively reduced, only the clonic phase may be obtained with a threshold stimulation.

Fourth stage (same parameters of stimulation). However, during the tonic phase, the current is intermittently raised from 450 to 700 ma. This procedure not only suppresses clonic movements but considerably increases the rigidity of the patient who shows an extensor spasm of the legs and flexor spasm of the arms. An autonomic response of a predominantly sympathetic nature is extremely pronounced.

It is interesting to compare the effects of these two modes of stimulation. Increased treatment duration with brief stimuli offers more possibilities of modifying tonic and clonic reactions as well as the autonomic response, while the large pulses delivered for a short time permit a variable latency time and isolated loss of consciousness with or without apnea.

The following differences in the pattern of the electroshock may be observed with techniques (a) and (b) respectively.

Convulsive reaction

Latency time. The time which elapses between stimulation and the onset of convulsion never exceeds 2 seconds with the BST technique. The short latency time is at variance with that observed with the conventional method. In the greatest number of cases, it is shorter than 1 second, while in the classical technique, the latency time may be as long as 50 seconds.

Petit mal reactions. Every practitioner has had experience with petit mal reactions occurring when the current produced by the classical method is not sufficiently strong to elicit a convulsion. The short loss of consciousness is undoubtedly a psychological expression of the physiological processes which are prevailing during a prolonged latent period of a grand mal response, but which are not sufficiently "self-increasing" to lead to a convulsion. Just as prolonged latency periods are not observed with the brief stimulus technique, so petit mal reactions are missing when this method is used.

Initial cry. The initial cry is observed in a relatively small proportion of cases when brief stimuli are used. The explanation for this discrepancy cannot be given adequately as yet.

Convulsive pattern. The pattern of the major convulsive reaction with BST is but slightly different from that obtained with the classical method. The convulsion is somewhat prolonged but is usually milder. In 18 patients studied initially, the average duration of the tonic phase was 8 seconds; that of the clonic phase was 41 seconds. In 4 patients treated with both conventional and BST stimulation, the tonic phase averaged 1 second longer and the clonic 8 seconds longer with the latter. The fact that the clonic phase is more prolonged than the tonic one is probably significant, since severe convulsions are characterized by an overdevelopment of the tonic phase. When the current is close to threshold value, the patient may exhibit a preponderance of head movements around the vertical axis (the

patient saying "no" to the doctor) instead of the usual movements around the horizontal axis (the patient saying "yes" to the doctor).

It is important to know that there are considerable individual differences. There are patients who present a very mild convulsion, such as is never seen with the conventional technique. Many patients, however, exhibit a convulsive pattern analogous to the average convulsion produced by the classical method. On the other hand, very severe convulsions can be produced by BST if a faulty technique is used (unduly high peak current).

A "mild" type of convulsion may also be observed with the original Friedman-Wilcox technique (d) using a long time of stimulation, as well as with the "unidirectional currents" (80–83) having high frequency and brief stimuli as their essential components.

Associated phenomena. Pilomotor and pupillary reactions are observed with both BST and classical technique, but may be more pronounced with the latter. However, when a long treatment duration is used with brief stimuli, the autonomic responses may be very pronounced (29, 31). Some of these responses may be due to diffusion of the current toward the sympathetic ganglia of the neck (16) and some to the direct stimulation of the brain (29–31). These effects were used by Hirschfeld and by Alexander (3) for therapeutic purposes.[2]

Although some individuals breathe throughout a mild convulsion elicited by brief stimuli, post-convulsive apnea in some patients may be just as pronounced as with the classical technique. In these cases, Alexander (3) has shown that subconvulsive excitation may initiate resumption of respiration.

Post-convulsive period

The post-convulsive confusion, retrograde amnesia, and motor discoordination following a convulsion produced by the conventional technique are too well-known to be considered in detail. All these effects of treatment are considerably milder and of shorter duration when BST is used. Here again, great individual differences are observed. Some patients show the same duration of post-convulsive confusion as the average individual submitted to the conventional technique: some present exceptionally brief durations of confusional state, and one or two minutes after the end of the convulsion appear completely oriented. We observed patients in perfect contact while still presenting dyspnea following the convulsion. Specific determinations of "time of orientation" or "time of recognition" made respectively after the classical procedure and after BST, show at least a doubling of this time in all patients with the classical technique. Scherer

[2] Subconvulsive stimulation with brief stimuli in the lowest degree was used by Berkowitz (5–8) and Jacobson (33).

(68) has evaluated the "times of recognition" of common objects after convulsions produced by BST, either with bi-temporal-frontal or vertex-temporal position of electrodes. These times were relatively brief and did not depend upon the location of the electrodes.

A quick return to the pre-convulsion level may be achieved with the original Friedman-Wilcox (FW) technique of prolonged stimulation with vertex-temporal electrodes. However, an experimental study we performed with Wilcox (52) showed that the degree of retrograde amnesia is significantly higher with the FW technique than with the BST. In this study, each patient was given the following items to remember within a five-minute period preceding the convulsion: a) a simple design; b) a word; c) a three-digit number. The designs and words

TABLE 11

EXPERIMENT	NUMBER OF PATIENTS	AVERAGE MEMORY SCORE AFTER A CONVULSION PRODUCED BY	
		BST	FW
1	2	3.7	2.6
2	2	4.2	2.5
3	4	1.1	0.9
4	2	6.4	3.3
5	2	2.3	4.4
6	2	6.4	4.2
7	2	4.1	4.8
Average		3.7	2.9

were taken from the Hunt Minnesota Test. As soon as the patient opened his eyes during the post-convulsive period, he was asked; 1) to recognize the design among nine samples taken from the same test, and 2) to give the word and number he had been asked to remember. The scoring was based on the percentage of correct responses in the population studied. By this method, the scores were established as follows:

1) Correct design 1.3
2) a. One digit correct 1.8
   b. Two digits correct 2.0
   c. Three digits correct 2.9
3) Word correct 2.2

The total score was computed by adding the partial scores. The score for two digits included that for one digit, and likewise the score for three digits included those for one and two. The maximum score, therefore, was 6.4.

Various variants of BST and FW techniques were compared on the same patients with the results shown in table 11.

The memory scores were the same or better in all except three cases following BST. No difference was found in this series as to the placement of electrodes (bi-temporal versus vertex-temporal). Still higher averages were obtained with BST by Medlicott who studied the memory scores comparatively with the conventional technique (57). He found a score of 4.4

after BST and a score of 3.4 after the conventional technique. Analogous results were found by Cox (13).[3]

After BST treatment, the patient leaves the treatment room well-oriented and steady in his gait. At this time, he usually has a retrograde amnesia for the period following or including the fixing of the electrodes although this procedure may be remembered later in the day. Because of the lesser "dulling" effect of BST, one may keep better contact with the patient for psychotherapeutic purposes after treatment. This was confirmed by Medlicott (56, 57).

Miscellaneous. According to Medlicott, nausea and vomiting immediately after BST were less frequent than with the standard technique.

---

[3] Despite the superiority of BST over the FW technique in regard to memory disorders, the FW method produces less amnesia than the classical technique (as well as a milder convulsion which is elicited with lower current). In view of these results, the conclusion was made that these differences were due to the "unidirectional" nature of the current which, according to Delmas-Marsalet (14), is less dangerous than alternating current. However, the comparison of the effects produced by these independent investigators convinces one that the mildness of convulsions, decrease of memory disorders, and slight EEG changes obtained with the original unidirectional FW technique are not due to the rectifying of the current but to the long treatment duration (in addition to the vertex-temporal location of the electrodes used by Friedman and Wilcox (19). Delmas-Marsalet used a direct pulsating current with a treatment duration of 0.15 to 0.5 seconds, the same as in the conventional technique, while Friedman and Wilcox used a current spread over a period of several seconds because of its secondary interruption. In so doing, they placed themselves at the lower end of the curve representing the relationship between the current and the treatment time, the curve determined initially by Hemphill and Walter (28). With Delmas-Marsalet's technique using short treatment times, there are essentially comparable memory disorders as with the classical method.

Other considerations favor the same interpretation:

1) Larragoiti (37), using diphasic brief stimuli, could confirm essentially the same findings as we described for "unidirectional" brief stimuli.

2) We modified our initial technique of "unidirectional" brief stimuli by using a diphasic stimulus with the high amplitude pulse outlining above the zero-potential line the same quantity of electricity as that outlined below this line by a slow low amplitude pulse occupying the entire interval between the stimuli. This did not change the threshold of the convulsion (fig. 16). The zero line seemed simply to be displaced from the physiological viewpoint, toward the lowest end of the pulse (compare with "courant chevauchant" of Chweitzer (12).

There is also little evidence that the "unidirectional" nature of the currents used by Wilcox and others (80–83) is responsible for the mildness of their effects. This is due to the prolonged time of stimulation, to the presence of spikes and brief round-top and quasi-square waves, as well as to a high frequency of stimulation, factors which were introduced in the new Reiter machines after the effects of high frequencies and brief stimuli became known (Liberson, 42).

Neither does the form of stimuli seem to be an essential factor. Offner showed that, from the theoretical point of view, square waves are not the optimal form of stimulating current, but are close enough to be used effectively. They offer the great advantage of being easily calibrated. Liberson and Wilcox (52) have shown that spiky or round-top waves could be at least as effective as the square waves, the essential feature being their duration.

Headaches were sporadic but severe and persistent in only one instance. It was proved in this case that the headaches were psychogenic in origin. More women continue to menstruate during BST therapy than during classical therapy (48).

In our experience, no major complication occurred. Out of 80 patients initially reported (48), one patient presented prolonged apneas, progressively increasing with consecutive treatments and necessitating discontinuation of therapy. There were no fractures of the extremities although three mild vertebral compressions were observed. In another group, we observed more compression fractures when the total time of stimulation was halved and the peak current correspondingly considerably increased.

In a series reported by Sayle and Josephs (22) of 50 patients treated by BST, there were only two small and practically symptomless compressed fractures. In the same number treated with the conventional technique and with the same team of aides, there were twelve fractures detected by routine x-ray examination. In 50 patients treated with BST by Medlicott, there was only one compression fracture, this in a frail elderly woman with widespread rheumatoid arthritis and osteoporosis. Curiously enough, she was the only one who received curare prior to treatment. Medlicott states that in this series there were fewer complaints of muscular pain than with the standard technique. "Slow rise" of the excitatory current (brief glissando; 72, 74) results in a further reduction of fracture.

Delayed psychophysiological changes

EEG changes. Since the early research of Levy, Serota, and Grinker (39), it has been known that changes may be detected by EEG, weeks, sometimes months, after the end of a series of treatment. We could show that the EEG can be modified not only on the stimulated hemisphere, but also over the opposite side (42, 43, 46). This method, therefore, offers possibilities of detecting lasting modifications taking place in the nervous tissues, shattered by recurring tides of physiological discharges and not submitted directly to the electric current. Although drastic EEG changes are usually replaced eventually by normal activity no one can ascertain how many neurons become inactive during this process of an apparent reversibility. Dead cells lose the opportunity of speaking for themselves.

Proctor and Goodwin (63, 64) showed that when lower intensity of current is used during a longer time of application, EEG changes are less pronounced, particularly insofar as the high amplitude delta waves are concerned. Recently these high amplitude, rhythmic frontally predominant, bilaterally synchronous delta waves, which at times are seen only after a preliminary sedation of the patient, were ascribed to the effects of the convulsive stimulations upon the diencephalon (67). Conversely, the EEG changes can be reduced by preliminary injections of benzedrine (38). Significantly, the high amplitude delta waves may be suppressed by sensory or

mental stimulation in the early period of therapy but they become less and less affected by such stimulation as the number of treatments increases (49).

EEG changes are at a minimum with BST. Thus, in patients treated by BST, only 10 per cent showed delta activity on the fifth day following the tenth treatment, and 33 per cent showed no change. Under similar conditions 50 per cent of patients treated with a conventional technique showed delta waves. The most commonly observed change following BST was a moderate slowing of the basic alpha frequency. Subconvulsive stimulation (stage 1) does not produce any change in the EEG (66).

Intelligence and memory tests. It is a common observation that patients undergoing conventional electric shock therapy present various degrees of memory disorders (77). However, when these changes are evaluated with psychometric tests, clinically observed changes elude the investigator in a great number of cases. This may be due to the inadequacy of the applied techniques; it may also be due to the general improvement of the patient's mental state; the patient compensates for impairment of memory functions by increased cooperation. However, some investigators found a significant change. For instance, Stone (71) found a 16 per cent decrease in the performance of the Wechsler memory test one day after the end of a series of conventional treatments and a 27 per cent rise two weeks thereafter. Serial subtraction of sevens (time score) was temporarily affected in patients studied by Pascal and Zeaman (62). Zubin (85) observed that shock affects learning acquired immediately before the treatment more than that acquired at an earlier date. According to Janis (34), the amnesia found after shock is selectively related to affective situations.

All investigators concur in stressing the absence of any impairment of intellectual functions after series of treatments administered with brief stimuli. The following table summarizes the results obtained in 21 patients under our observations:

SERIAL SEVENS, NUMBER CORRECT		WECHSLER MEMORY		SHIPLEY-HARTFORD		WORD ASSOCIATION TEST			
						Reaction time		Popularity	
Before	Change in %	Before	Change in %	Before	Change in %	Before	Change in %	Before	Change in %
8.7	+21	77	+13	73	−3	3.5	+8	.18	+6

The tests were given prior to treatment and on the fourth or fifth day following the tenth convulsion. There was improvement in serial sevens, Wechsler memory test, and popularity of responses for the Word Associa-

tion test. There was practically no change in the Shipley-Hartford score, and a slight increase in the duration of the word association time (for neutral words). This latter increase is much less pronounced than the 20 per cent increase found during a previous investigation on schizophrenic patients before and after classical shock therapy (44).

Recently, Scherer (69, 70) extended these observations on a greater number of tests given to patients who received BST with bi-temporal-frontal electrodes. No impairment of intellectual functions could be detected.

However, the most significant experiment was carried out by Medlicott (56, 57). "Follow-up questionnaires sent to patients' relatives at intervals after discharge included reference to the presence of any memory defect. Relatives reported some memory defect present in 8 per cent of cardiozol-treated patients and in 33 per cent of standard BCT patients, but in none of the BST patients. As the same form had been sent to relatives of each group, the lack of noticeable memory defects with BST is impressive."

Alexander (3) reports that remarkable improvement of the memory disorders produced by conventional therapy follows a series of subconvulsive treatments using high frequency "spike" currents.

Analogous results were obtained in cats made experimentally neurotic and then subjected to electroconvulsive shock. These animals showed disintegration of complex normal and neurotic patterns which was more pronounced with 60 cycle alternating current treatment than with direct interrupted current (Masserman, 54).

Fear reaction. Gottesfeld, Baker, and Anglas-Quintana (26) found that 80 per cent of patients submitted to classical electric shock therapy reported fear of treatments. The percentage of patients showing fearfulness toward BST treatments can hardly be superior to this figure. In Gayle's opinion (22), patients who received BST did not on the whole object to the procedure much more than those receiving conventional electroshock, even though more patients recalled the impact of the current. The explanation of these remarkable results is to be found in the comprehensive efforts of the staff and of cooperative patients to neutralize the demoralizing talk of a few complainers.

And yet, the problem of fear is the real shortcoming of all the new forms of electric convulsive therapy. Although it may be minimized by psychotherapy, preliminary sedation, or other procedures (see page 210), it remains of great theoretical and practical significance. It seems to be inversely related to the changes of consciousness during treatment and therefore to the degree of amnesia realized by the stimulation, unless the patient dreads the very factor which might relieve him from fear—the state of unconsciousness itself.

During very mild convulsions, the patient may conserve a partial insight and claim having perceived rhythmical movements. At times this "dissociation" of the total electric shock pattern results only in an incomplete retrograde amnesia for the stimulating period. This is never described as painful, but definitely unpleasant. The patient feels that he is being lifted in the air, is seeing lights, or hearing the nurse's voice ("ready, doctor"). These "dissociations" should be very carefully avoided as they increase fearfulness and make the patient resistive to the treatment. It seems that such dissociation is increased by the use of very brief stimuli — 0.3 millisecond or below.

In summarizing, we may say that the analytical study of various parameters of the stimulating current led us to single out the following most important factors (besides the intensity of the stimulation): pulse duration, frequency of repetition, total duration of stimulation. The form of the pulses and their being or not being "unidirectional" are of a secondary, if of any, importance. Clinical and animal research showed that the psychophysiological effects of milder forms of convulsive excitation (long duration of stimulation, high frequency, brief stimuli) differ from those of conventional techniques (short total time of stimulation, low frequency of repetition, long stimuli) in the following respects:

1) *Immediate psycho-physiological effects*
   a) Shorter latency time
   b) No independent loss of consciousness (no "petit mal" reaction)
   c) Milder convulsions
   d) Less autonomic stimulation (unless stimulation is very prolonged)
   e) Possibility of eliciting only clonic types of convulsions
2) *Secondary psycho-physiological effects*
   a) Shorter time of reorientation
   b) Quicker motor recoordination
   c) Less retrograde amnesia
   d) Less headaches
   e) More fear (if no presedation)
3) *Delayed psycho-physiological changes*
   a) Less or no EEG changes, particularly less delta activity
   b) Less or no memory disorders or confusional states
   c) Less endocrine changes (menstruation)
   d) Better insight
   e) More fear of further treatments
   f) A greater number of treatments required to obtain the same clinical effects in depressive states

These differences in the convulsive reactions elicited with different techniques shattered a conception which is still prevalent in the minds of

many clinicians—namely, an "all-or-none" character of the electrically-induced convulsion. These studies showed that, on the contrary, the total pattern of the electroshock may be dissociated in its various components, the convulsion being only part of the overall excitation of the brain. Just as human pathology realizes a multitude of forms of seizures, so variation of the conditions of electrical stimulation may to a certain degree selectively modify these different components by either exaggerating or decreasing their manifestations. Varying the parameters of stimulation, one may seek optimum threshold values for different currents affecting one or another of the components of the total convulsive pattern. These different currents may be used either simultaneously, in succession, or during different therapeutic sessions.

In a search for a variable synthesis of such selective and differential effects of various currents, one must 1) better understand the reciprocal relationship of the parameters of the stimulation, and 2) find the most effective combinations of the currents for therapeutic techniques. Recent studies in this direction are summarized below.

A SEARCH FOR A SYNTHESIS

Previous studies suggested that there may be at least two different modes of producing a major therapeutic convulsion. The first consists in stimulating the brain over the fronto-temporal regions, relatively far from the motor cortex (but having the epileptogenic areas of the temporal lobe and probably the middle structures of the brain in the lines of the current) with a limited number (6 to 20) of powerful stimuli of long duration and relatively low frequency. Immediately at the end of the stimulation, the patient does not convulse but is stunned. The state of excitation does not remain within the cells under direct attack, for these start to fire in turn repeatedly and in many directions. As soon as this happens, the state of excitation is no longer under the control of the therapist. The excitatory phenomenon outlasts and outspreads the initial stimulation. As it moves all over the cortex, it gains momentum by a process of self-amplification. Thousands and thousands of new neurons are recruited in the process and contribute their fire to the preceding conflagration. When the process reaches the motor cortex (65, 59) (or possibly the uncus; 50), the recruitment is still more intensified. A convulsion occurs after a certain latency time, nearly all the neurons of the brain having received their share of excitation. Then the patient lapses into post-ictal confusion. Because the convulsion is produced mainly by a self-sustaining phenomenon, the initial impact has to be of relatively considerable strength. Because of the involvement of a considerable portion of the brain, and particularly the temporal lobes, post-

ictal confusion is prolonged and the patient develops memory disorders. The possibility of some brain damage is not completely avoided. This is what seems to happen with the classical method of stimulation.

There may be a more subtle method of producing convulsion. In this method, brief stimuli are applied at a higher frequency during a relatively long treatment time. Thus they guide and sustain in some way the development of the excitation eliciting convulsion. The process is somewhat pushed along by the therapist. The latency time, during which the process is entirely self-sustaining, is short. As there are less cerebral tissues involved, and possibly less participation of the temporal lobes, the loss of consciousness is less profound and memory disorders are lacking. This is particularly true when the stimulation is applied directly over the motor cortex. Fractures are easily avoided. The longer treatment times permit the therapist to apply the therapeutic currents without or after the convulsive reaction. Subconvulsive currents may even stimulate the structures of the brain inhibited by preceding stimulation.

By repeated excitation of the somatic and autonomic nervous systems, one gives the patient a modified brain for a duration of a few weeks to a few months and thus permits him to carry on the neuro-dynamic events underlying psycho-dynamic processes in a different somatic background. It gives him another chance to solve his difficulties in a modified physiological climate. The question remains to what degree we have to modify this background; which should be the modified components; and for how long. Whatever the answer is, it may not be the same for different patients. Thus, a clinical scientist should investigate not only the effects of different components of the stimulating current, but also the possibilities of a variable synthesis of these components to be used in different diseases on the basis of both animal and human experimentation.

Animal experimentation

The analytical studies reported at the beginning of this paper aimed at the determination of the (a) optimum pulse duration when the frequency of repetition and the total time of stimulation remained unchanged; (b) optimal frequency, the pulse duration and total time of stimulation being constant; and (c) optimal total time of stimulation, the other two variables remaining fixed. However, in the light of the hypothesis of at least two different mechanisms of electrically produced convulsive patterns, one may question whether it is justified to consider these three parameters of stimulation as independent. In particular, one may wonder whether the optimal pulse duration is the same whatever the treatment duration and whatever the frequency of stimulation may be. The experiments[4] related below show

[4] We are indebted to Miss Miriam Clark for her help in carrying out these experiments.

that such an assumption, implicitly made in the previous studies, is not correct. Figure 14 shows strength-duration curves related to the threshold currents eliciting convulsions in guinea pigs when the total duration of stimulation is short (0.2, 0.3, and 0.5 seconds) and long (1 and 2 seconds). One can see that these curves are quite different. In the first case, the brief

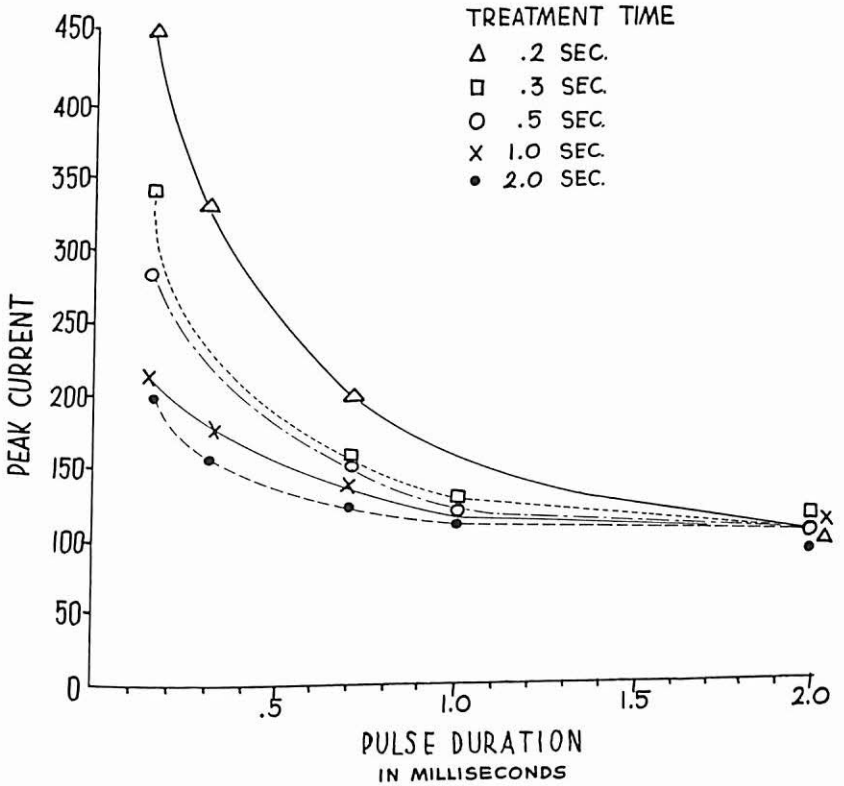


Fig. 14. Shows strength-duration curves as a function of the "treatment time" (from 0.2 to 2 seconds). Horizontal axis: pulse durations; vertical axis; peak current in percentage of the value found for a pulse duration of 2 milliseconds. Each point represents the average value for the convulsive threshold established on 5 different guinea pigs. The frequency of repetition was 120 per second throughout. The curve for treatment time of 0.2 seconds probably has not reached the rheobase level with the pulse duration of 2 milliseconds.

stimuli are relatively less effective than in the second. The chronaxie determined in the first case is 5 to 10 times longer than the one found in the second. In the cases represented in figure 14, the frequency of stimulation was 120 per second. If a frequency of 240 per second, and particularly one of 350 per second, is used, the brief stimuli are almost equally effective whatever the total duration of stimulation between 0.2 and 2 seconds (fig. 15). Table 12 shows the averages of the peak currents found in these experi-

ments. These experiments shed additional light on the problem. They confirm that when the total time of stimulation is short and the frequency of stimuli is relatively low, as they are in the classical technique, the mechanism of stimulation is different from the one involved in the case of a longer time of stimulation and a higher frequency of stimuli.

TABLE 12

*Threshold peak currents (in ma.) for different treatment times, pulse durations, and frequencies of repetition of stimuli**

PULSE DURATION	FREQUENCY PER SECOND	TREATMENT TIME (IN SECONDS)				
		2.0	1.0	0.5	0.3	0.2
ms.						
2.0	350		28			66
	240		24			68
	120	23	33	36	61	70
1.0	120	25		43	76	
0.7	350		28			66
	240		24			78
	120	28	43	53	93	140
0.3	350		32			77
	240		26			93
	120	35	54	78	136	228
0.2	350		35			80
	120		51			239
0.15	350		43			94
	240		42			141
	120	45	67	100	207	316

* Each figure represents the average of the data obtained on five guinea pigs.

No information is available at present to indicate a choice between different hypotheses which could explain the presence of those various mechanisms. At least two such hypotheses may be formulated:

1) Different anatomical structures are initially involved in these various mechanisms, each one characterized by distinct time factors of excitatory processes.

2) Each long stimulus of high intensity may elicit a repetitive response in the stimulated cell and therefore produce a higher frequency of stimulation when high amplitude pulses are applied during a short total time of stimulation. Brief stimuli are less effective in producing repetitive responses (36).

Whichever hypothesis may prove to be correct (and both may be partially justified), the fundamental findings remain unchallengeable: the optimal duration of the stimulus has to be determined according to the value of the other parameters of stimulation; the parameters of stimulation have to be adjusted to the desired effects of excitation.

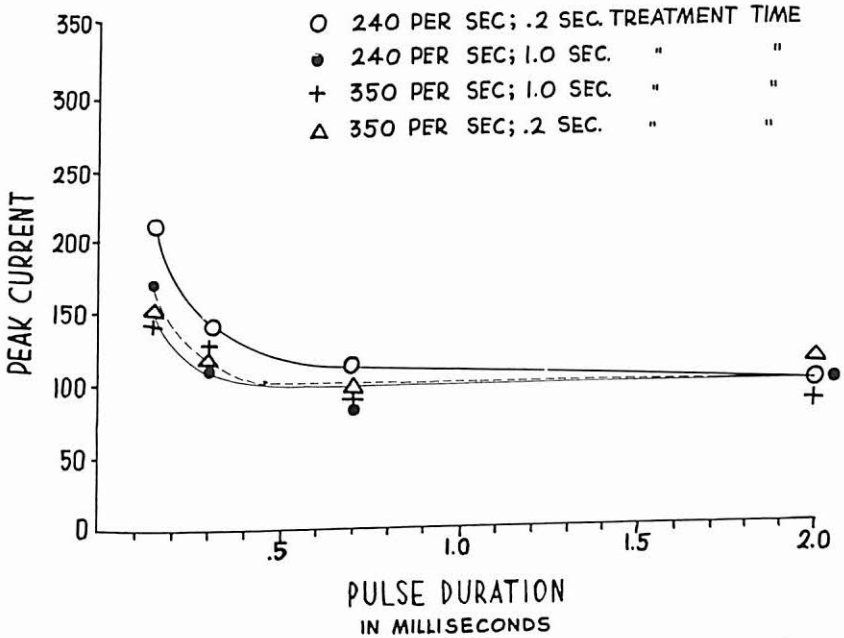


Fig. 15. Represents the strength-duration curves for frequencies of repetition of 240 and 350 per second and for "treatment times" of 0.2 and 1 seconds. Horizontal axis: pulse duration; vertical axis: peak current.

The lowest curve is for a frequency of repetition of 350 per second and is the same for both the short and the long "treatment time" (0.2 and 1 seconds). The upper curve is for the frequency of repetition of 240 per second and treatment time of 0.2 seconds. The intermediate curve is for the frequency of repetition of 240 per second and treatment time of 1 second. Each point represents the average value for the convulsive threshold determined on 5 different guinea pigs.

Attempts to establish rational techniques of convulsive therapy

Methods of stimulation. The original BST technique consists in the use of 120 per second current for 1 to 2 seconds with pulse durations of 0.5 to 0.7 milliseconds. In case of inefficient stimulation, two or more trials should be made in succession within a few seconds. The patient may or may not be pre-sedated, according to the degree of anxiety.

This technique, however, may be combined with other methods of stimulation. This can be done by using different currents during different sessions. Thus BST can be combined with the classical therapy, as it is in

several institutions, being used on either the convulsive or subconvulsive (3) level. However, combined techniques could be used during the same session, as we suggested in a previous paper ("hybrid" methods; 47), thus considerably increasing the flexibility of electric shock therapy.

Goldman's technique (25) may be considered as one of the "hybrid" methods combining the convulsive with subconvulsive level of stimulation:

The patient is prepared for treatment with the usual electrode placement (vertex-temporal). 0.25 to 0.5 gm. pentothal sodium is injected rapidly intravenously. A brief period of apnea, 10 to 30 seconds, ensues if enough has been injected. When respirations are re-established the current is applied. The slow rise of current is always used. The initial setting is made for 150 to 200 peak milliamperes even though the maximum peak milliamperes is to be from 400 to 600. This is done so that current rise will not be too rapid since the electronic sweep or glissando is not sufficiently gentle for most purposes. The current button is pressed and immediately as the current rises to the initial setting, the manual current control knot is turned to raise the peak milliamperes to whatever level is desired. This depends upon the pulse duration—with low pulse durations of 0.3 to 0.7 milliseconds, from 500 to 600 or more peak milliamperes may be used; when 1.5 or 2.0 milliseconds pulse durations are used, not over 400 peak milliamperes should be used since the machine will probably not carry a current load beyond this point and the danger to the patient from respiratory difficulty has been found to be greater. The maximum peak current is maintained for 2 to 5 seconds; in younger individuals, the shorter duration is preferable. The current is then gradually diminished. From 5 to 15 seconds from the beginning of treatment, current is dropped from the maximum to a level of 50 to 100 peak milliamperes and is maintained at this point up to 20 to 30 seconds. The level of the maintenance current depends on the amount of suppression of clonic activity which is desired. Clonic activity can be completely suppressed with more current or can be allowed to appear in modified form with somewhat lower currents. The usual practice is to allow the clonic movements to appear so that one can be sure of the occurrence of the actual seizure. Respiratory difficulty is minimal or absent if the precautions advised are used. The use of long pulse durations has been found more effective in schizophrenic reactions and in manic states. The use of the shorter pulse durations has been found particularly useful with high peak current level in depressive states. The use of curare or other adjuvants to avoid skeletal difficulty is very rarely necessary with this technique since the convulsive seizure is quite gentle and apparently almost entirely safe for the skeleton.

Hirschfeld's bitemporal technique (29–31) of the four stages of stimulation was described in a preceding section.

Recently we suggested a new "hybrid" technique (fig. 16). Classical "sine wave" stimulation is applied through the bi-fronto-temporal position during a short time (0.5 seconds) in order to produce a "petit-mal" reaction and then is immediately followed by brief stimuli applied either through the same electrodes or through vertex-temporal electrodes (in which case, three electrodes should be applied). The rationale of this technique is to produce a change of consciousness prior to convulsive stimulation by using sine waves of lower intensities than those which are needed for the producing of a convulsion during the same time. Thus, a differential stimulation of different processes characterized by distinct time-constants is achieved by

this "wave-and-spike" therapy. This technique is under clinical trial at the present time in collaboration with Wiesel (51). It seems to produce less fear reaction than the original BST technique. It may be combined with sub-, para-, and post-convulsive stimulation.

Others have used analogous techniques (78–83, 2, 3, 20).

Instruments. The classical ECT machine is too well-known to need a description. The modern machines are provided with a device permitting a slow rise (glissando; 72, 74), and a long application of current.

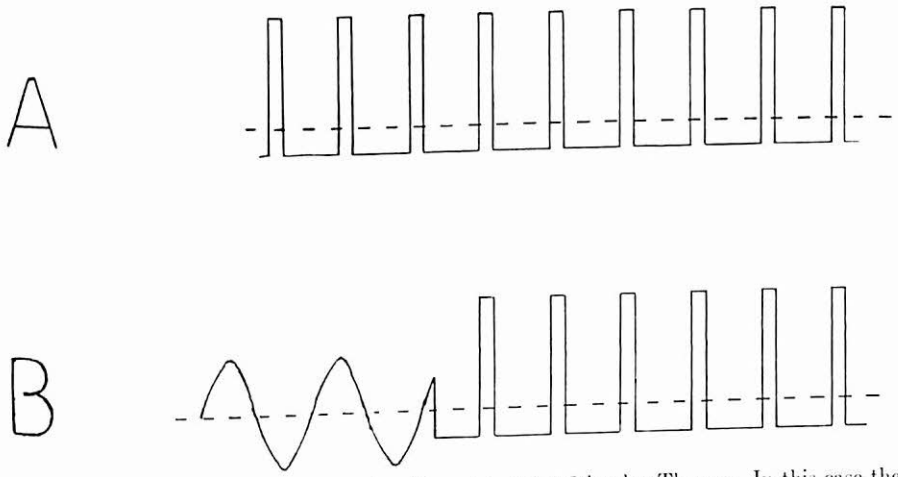


Fig. 16. A: The "courant chevauchant" used in Brief Stimulus Therapy. In this case the zero potential is above the line corresponding to the origin of the "spike". B: The "wave-and-spikes" current, the waves producing a "petit mal" and the spikes a convulsion.

The initial BST machine included the following: a current divider permitting the presetting of the current up to the one ampere peak; a current largely independent from the resistance of the head ("constant current device"); an indicator of the "average" and peak currents; a dial permitting change of the duration of the spikes; a dial permitting change of the total time of stimulation or a continuous application of the current; a device for instantaneous or slow rise of the current; safety devices.

The current used in the standard Offner model consists of 120 rectangular pulses per second. These pulses are not unidirectional in the strict meaning of this term as the quantity of electricity outlined by the "spike" above the zero line is compensated for by equal quantity of electricity delivered below the zero line, between the stimuli (fig. 16). The machine used by Larragoiti produced diphasic pulses, and the one constructed on the specifications of Medlicott the same as the ones which we recommended at the beginning of our research.

In the light of the previously reported research, a better instrument should comprise the following facilities in addition to the devices provided by the BST machines:

1) The possibility of changing the frequency of stimulation within a wide range.

2) Possibility of varying the total time of stimulation within a considerably wider range.
3) The possibility of finer adjustments of the current for subconvulsive stimulation (Hirschfeld).
4) The possibility of using long sine waves, at least for the production of "petit mal" reactions.
5) The possibility of a secondary interruption of the stimulating current.

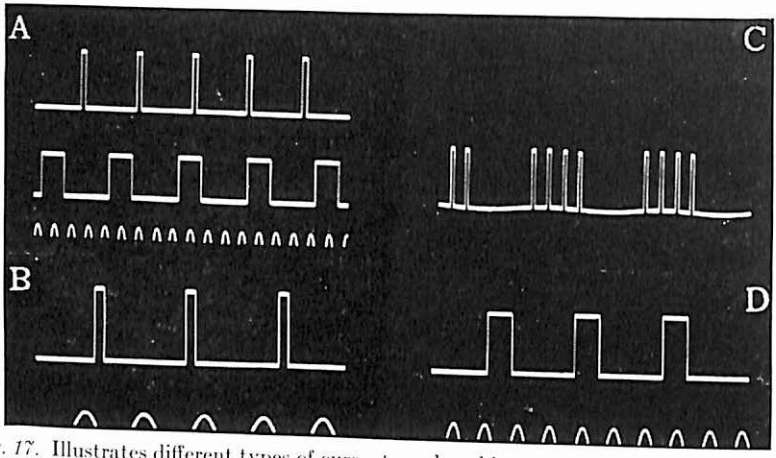


Fig. 17. Illustrates different types of current produced by the latest model of "Brief Stimulus Therapy" machine (courtesy of Dr. Offner).

A: Upper line: 0.3 milliseconds rectangular "spikes" with interval of 3 milliseconds (about 300 per second). Middle line: 1.5 milliseconds "spikes" with about the same interval. Lower line: Time 1,000 cycles per second.

B: 2 milliseconds rectangular "spikes" with interval of 15 milliseconds. Time 1,000 cycles per second.

C: Groups of "spikes" with interval between groups of 20 per second.

D: 1 millisecond "spikes" with interval of 2 milliseconds. Time: 1,000 cycles per second.

Such an instrument was recently constructed.[5] Figure 17 shows cathode ray photographs of the "spikes" (square-shaped) produced by this instrument for various frequencies and durations.

Reiter's "electro-stimulators" also realize a variety of stimulating currents with different psycho-physiological and therapeutic results. Variable pulse durations (from brief spikes to unidirectional, rectified, and modified half-cycles of alternating current), frequencies (interrupted secondarily or not) and forms (including almost rectangular pulses) of stimuli are used. In addition, the amplitude of the pulses may be "modulated" with various durations of the cycle of modulation.

[5] We are indebted to Dr. F. Offner for his patience, knowledge, and skill in redesigning the Brief Stimulus machine to fit our continually advancing information in this field. Without his contribution, this method could not be as scientifically tested and applied as it now is.

According to Alexander (3), these machines deliver 30 groups of 6 spikes pulses per second; unidirectional current averages 1.5 to 5 milliamperes with spikes up to 60 to 200 milliamperes in non-convulsive stimulation, and 8 to 20 milliamperes with spikes up to 320 to 600 milliamperes in convulsive stimulation (see also 80 to 83). Unfortunately, photographs of these currents are not available.

Some of the features of the Reiter machines undoubtedly aim at the change of such known factors as 1) pulse duration, and 2) frequency of repetition, although the machines do not provide the operator with a calibration of these factors. Some other features of these currents such as the details of variable wave forms during one modulation cycle, the relation of peak current to average meter reading, etc., seem to be incidental and dependent upon the convenience of construction; at least their rationale has never been submitted to an experimental control. The latter remark could also be made in regard to the principle of the modulation of the amplitude of the individual pulses.

The evolvement of rational techniques of electrostimulation is still in progress. A great amount of research, both analytical and synthetical, remains to be carried out on experimental and clinical grounds. One must realize that the aim of such research is not to select one single method, much less one single machine, most appropriate for use in psychiatry. The aim of such research is to define all the modalities of the electrostimulation which may differentially or synthetically produce various psycho-physiological and therapeutic effects, variable according to the mental condition or the specificity of the individual case. It is in this complex way that electroneurophysiology will contribute to the problem of electrotherapy of mental disorders.

CONCLUSION

Studies in animals and man showed that the pulse intensity, pulse duration, pulse frequency, and treatment time are the essential parameters of stimulating current in regard to its psycho-physiological effects. The form of the current and its being or not being "unidirectional" are of secondary importance. Using these various parameters, one may dissociate the total pattern of electroshock by intensifying or decreasing these various components.

In particular, two modes of stimulation can be differentiated. One, with stimuli of long duration applied during a short treatment time at a relatively slow frequency, is realized by the conventional technique. The second utilizes brief stimuli of higher frequency applied during longer treatment time with or without secondary interruption of the current. With the second type of therapy, there are less EEG changes, less memory disorders (no confusional state), less change in the autonomic nervous system, and less endocrine changes than with the first type. However, by

varying the intensity of the brief stimuli current applied over a still longer treatment time, various effects may be produced in addition to the changes due to the convulsion-eliciting stimulation. These effects comprise the autonomic nervous system changes and respiratory stimulation.

Additional animal experimentation showed that the different parameters of stimulating current involved in the two above-outlined methods cannot be considered independently. Thus, the optimum pulse durations are different when the treatment time is short or when it is long and different for various frequencies of stimulation.

These observations suggest the advisability of combining different currents in order to produce differential and synthetic psycho-physiological and therapeutic effects. Various possibilities of a synthesis of different currents employed in electrotherapy of mental disorders are discussed.

REFERENCES

1. Adrian, E. D.: The spread of activity in the cerebral cortex. J. Physiol., *88:* 127–61, 1936–37.
2. Alexander, L.: The suppression of the clonic phase in electrically induced convulsions in men. Trans. Am. Neurol. Assoc., 244–47, June, 1950.
3. Alexander, L.: Nonconvulsive electric stimulation therapy. Its place in the treatment of affective disorders with notes on the reciprocal relationship of anxiety and depression. Am. J. Psychiat., *107:* 241, 1950.
4. Arieff, A. J.: Threshold studies in electrical convulsions using a square wave stimulator. Quart. Bull. Northwest. Univ. M. School, *22:* 10–17, 1948.
5. Berkwitz, N. J.: Faradic shock treatment of the "functional" psychoses. J. Lancet, *59:* 351–55, 1939.
6. Berkwitz, N. J.: Faradic shock in treatment of functional mental disorders. Treatment by excitation followed by intravenous use of barbiturates. Arch. Neurol. & Psychiat., *44:* 760–75, Oct., 1940.
7. Berkwitz, N. J.: Treatment of mental disorders with pharmacological and electrical shock methods. Minnesota Med., *24:* 25–29, Jan., 1941.
8. Berkwitz, N. J.: Non-convulsive electric (faradic) shock therapy of psychosis associated with alcoholism, drug intoxication and syphilis. Am. J. Psychiat., *99:* 364–73, Nov., 1942.
9. Boynton, E. P. and Hines, M.: On the question of threshold in stimulation of the motor cortex. Am. J. Physiol., *106:* 175–82, 1933.
10. Bremer, F., Bonnet, V. and Moldaver, J.: Contributions à l'étude de la physiologie générale des centres nerveux. I. La sommation centrale. Arch. Internat. Physiol., *52:* 1–56, March, 1942.
11. Cerletti, U. and Bini, L.: L'ellettroshock. Arch. gen. di Neurol. Psichiat. Psicoanal., *19:* 266–68, 1938.
12. Chweitzer, A.: Recherches sur les lois de la stimulation électrique des nerfs envisagée comme une variation d'intensité de sens constant. Arch. Internat. Physiol., *40:* 398–421, March, 1935.
13. Cox, R.: Master's theses, Trinity College, Harford, Conn., 1949.
14. Delmas-Marsalet, P.: L'électro-choc par courant continu. C. R. de la Soc. de Biol. de Bordeaux, 11 Feb., 1942.

15. Delmas-Marsalet, P.: L'électro-choc thérapeutique et la dissolution-reconstruction. J. B. Ballière et fils, Paris, 1943.
16. Delmas-Marsalet, P.: L'électro-choc et thérapeutiques nouvelles en neuropsychiatrie. J. B. Ballière et fils, Paris, 1946.
17. Delmas-Marsalet, P., Servantie, L. et Faure, J.: Technique expérimentale de l'électro-choc. C. R. de la Soc. de Biol. de Bordeaux, 8 March, 1944.
18. Dusser de Barenne, J. G. and McCulloch, W. S.: Am. J. Physiol., *114:* 692, 1936.
19. Friedman, E. and Wilcox, P. H.: Electrostimulated convulsive doses in intact humans by means of unidirectional currents. J. Nerv. & Ment. Dis., *96:* 56–63, July, 1942.
20. Frosch, J., Impastato, D. and Wortis, S. B.: Intensive electroshock treatment with Reiter apparatus. Am. J. Psychiat., *108:* 204–07, Sept., 1951.
21. Frostig, J. P., van Harreveld, A., Reznik, S., Tyler, D. B. and Wiersman, C. A. G.: Electronarcosis in animals and man. Arch. Neurol. & Psychiat., *51:* 232, 1944.
22. Gayle, R. F. and Josephs, D.: Brief stimuli therapy. South. Med. J., *41:* 245–251, March 1948.
23. Glusman, M., Pool, J. L. and Ransohoff, J.: The electrical excitability of the motor cortex and uncus in man. East. Assoc. EEGers Meet., Dec., 1951.
24. Goldman, D.: Brief stimuli electric shock therapy. Am. Psychiat. Assoc. Meet., May, 1947.
25. Goldman, D.: Personal communication, 1948.
26. Gottesfeld, B. H., Baker, C. L. and Anglas-Quintana, P.: An interpretative study of subjective response to electric shock treatment. Diges. Neurol. & Psychiat., *14:* 642–48, Dec., 1946.
27. Gottesfeld, B. H., Lesse, S. M. and Herskovitz, H.: Studies in subconvulsive electric shock therapy, effect of varied electrode application. J. Nerv. & Ment. Dis., *99:* 59–64, Jan., 1944.
28. Hemphill, R. C. and Walter, W. G.: The treatment of mental disorders by electrically produced convulsions. J. Ment. Sc., *87:* 256, 1941.
29. Hirschfeld, G.: Non-convulsive electro-stimulation. A new method of therapy in mental disorders. New Jersey Neuropsychiat. Assoc., April, 1949.
30. Hirschfeld, G.: Observations with non-convulsive electro-stimulation (a new method of therapy to certain mental disorders) Psychiat. Quart. Supp., Part 2, 1950.
31. Hirschfeld, G. and Bell, J.: Differential cerebral stimulation. Dis. Nerv. Syst., *12:* 3–7, Sept., 1951.
32. Ivy, A. C. and Barry, F. S.: Studies on the electrical stunning of dogs. Am. J. Physiol., *99:* 298–307, 1932.
33. Jacobson, J. Personal communication. 1948.
34. Janis, I. L.: Memory loss following electroconvulsive treatments. J. Personal., *17:* 29–32, 1948.
35. Jung, R.: Hirnelektrische Untersuchungen uber den Elektrokrampf. Die Erregbarkeitsablaufe in corticalen und subcorticalen Hirnregionen bei Katze und Hund. Arch. Psychiat., *183:* 206 1950.
36. Lapicque, L.: Herman, Paris, 1940.
37. Larragoiti, R. J.: La terapeutica convulsivante par estimulo breve: Bentajas e inconvenientes. Arch. Soc. estud. clin. Habana, *41:* 239–255, 1948.
38. Lennox, M. A., Ruch, T. C. and Guterman, B.: Effect of Benzedrine on the post electroshock EEG. EEG & Clin. Neurophysiol., *3:* 63–69, Feb., 1951.
39. Levy, N. A., Serota, H. M. and Grinker, R. R.: Disturbances in brain function following convulsive shock therapy; EEGic and clinical studies. Arch. Neurol. & Psychiat., *47:* 1009–1029, June, 1942.

40. Liberson, W. T.: Quelques observations sur les réflexes médullaries du Crapaud. C. R. Soc. Biol., *113:* 884, 1933.
41. Liberson, W. T.: Observations sur les caractères myographiques des réflexes médullaires du Crapaud. C. R. Soc. Biol., *120:* 874, 1935.
42. Liberson, W. T.: New possibilities in electric convulsive therapy: "brief stimuli" technique. Digest Neurol. & Psychiat., *12:* 368–69, 1944.
43. Liberson, W. T.: Time factors in electric convulsive therapy. Yale J. Biol. & Med., *17:* 571–78, March, 1945.
44. Liberson, W. T.: Study of word association processes: reactions to "average emotional" and "average neutral" words in normal and abnormal populations: effect of electric convulsive therapy. Digest Neurol. & Psychiat., *13:* 671–80, Dec., 1945.
45. Liberson, W. T.: U. S. Patent 2473378, March 1946–June 1949.
46. Liberson, W. T.: Physiological basis of electric convulsive treatment. Conn. St. Med. J., *10:* 754–56, Sept., 1946.
47. Liberson, W. T.: Some technical observations concerning brief stimulus therapy (BST). Digest Neurol. & Psychiat., *15:* 72–78, Feb., 1947.
48. Liberson, W. T.: BST. Physiological and clinical observations. Am. J. Psychiat., *105:* 28–29, 1948.
49. Liberson, W. T.: Ondes électriques du cerveau et intelligence chez les malades mentaux. L'Année Psychol., Volume Jubilaire, 678–703, 1951.
50. Liberson, W. T., Scoville, W. B. and Dunsmore, R. H.: Stimulation studies of the prefrontal lobe and uncus in man. EEG & Clin. Neurophysiol., *3:* 1–8, Feb., 1951.
51. Liberson, W. T. and Wiesel, B.: Unpublished.
52. Liberson, W. T. and Wilcox, P. H.: Electric convulsive therapy; comparison of "brief stimuli technique" with FWR technique. Digest Neurol. & Psychiat., *8:* 292–302, March, 1945.
53. Livingston, R. B., Chapman, W. P., Livingston, K. E. and Kraintz, L.: Stimulation of orbital surface of man prior to frontal lobotomy. Res. Publ. Assoc. Nerv. Ment. Dis., *27:* 421–32, 1948.
54. Masserman, J. H.: Experimental neuroses. Scient. Am., *182:* 38, 1950.
55. Masserman, J. H., Arieff, A., Pechtel, C. and Klehr, H.: The effects of direct interrupted electroshock on experimental neuroses. J. Nerv. & Ment. Dis., *112:* 384, 1950.
56. Medlicott, R. W.: Experience with the brief stimuli machine in electro-convulsive therapy. Digest Neurol. & Psychiat., *14:* 574, Oct., 1946.
57. Medlicott, R. W.: Brief stimuli electroconvulsive therapy. New Zealand Med. J., *47:* 29–37, 1948.
58. Meyer-Mickeleit, R. W.: Das Elektrencephalogramm beim Elektrokrampf des Menschen. Arch. Psychiat., *183:* 12, 1949.
59. Moruzzi, G.: L'épilepsie Expérimèntale. Paris, Hermann, 1950.
60. Noel, G.: Etude oscillographique de l'épilepsie corticale chez le chat. Arch. Internat. Physiol., *51:* 162–195, May, 1941.
61. Offner, F.: Stimulation with minimum power. J. Neurophysiol., *9:* 387–90, Sept., 1946.
62. Pascal, G. R. and Zeaman, J. B.: Measurement of some effects of electro-convulsive treatment on the individual patient. J. Ab. & Soc. Psychol., 461104, 1952.
63. Proctor, L. D. and Goodwin, J. E.: Comparative EEGic observations following electroshock therapy using raw 60 cycle alternating and unidirectional fluctuating current. Am. J. Psychiat., *99:* 525–530, Jan., 1943.
64. Proctor, L. D. and Goodwin, J. E.: Clinical and electrophysiological observations following electroshock. Am. J. Psychiat., *101:* 797–800, May, 1945.
65. Rosenblueth, A. and Cannon, W. B.: Cortical responses to electric stimulation. Am. J. Physiol., *135:* 690–741, Feb., 1942.

66. Rosenblum, M. P.: EEGic study of non-convulsive electrostimulation. Am. Psychiat. Assoc., Meeting, 1950.
67. Roth, M.: Changes in the EEG under barbiturated anesthesia produced by electroconvulsive therapy and their significance for the theory of ECT. EEG & Clin. Neurophysiol., *3:* 261–280, Aug., 1951.
68. Scherer, K. W.: Personal communication, 1948.
69. Scherer, I. W.: Prognoses and psychological scores in electroconvulsive therapy, psychosurgery and spontaneous remission. Am. J. Psychiat., *107:* 926–31, June, 1951.
70. Scherer, I. W.: Effect of brief stimuli electroconvulsive therapy upon psychological test performance. J. Consult. Psychiat., *15:* 430–434, 1951.
71. Stone, G. P.: Characteristic losses and gains in scores on the Wechsler Memory Scales as applied on psychotic patients before, during, and after a series of electro-convulsive shocks. Am. Psychol., *1:* 245, 1946.
72. Tietz, E. B.: Further Experiences with electronarcosis. J. Nerv. & Ment. Dis., *106:* 150–58, 1947.
73. Tietz, E. B.: Electronarcosis. Ann. West. Med. & Surg., *2:* 562–564, 1948.
74. Tietz, E. B., Olsen, C. W. and Rosanoff, W. F.: The suppression of the motor phenomena of electroshock and electronarcosis by modification of the current level. J. Nerv. & Ment. Dis., *109:* 405–08, 1949.
75. Toman, J. E. and Goodman, L. S.: Conditions modifying convulsions in animals, pp. 141–163 in Epilepsy. Res. Pub., Assoc. Res. Nerv. & Ment. Dis., Baltimore, The Williams & Wilkins Co., 1947.
76. van Harreveld, A., Plesset, M. S. and Wiersma, C. A. G.: Am. J. Physiol., *107:* 39–46, 1942.
77. Wilcox, K. W.: Psychological studies in electroshock therapy. Michigan Acad. Science, Arts & Letters, *35:* 357–368, 1949.
78. Wilcox, P. H.: Brain facilitation not brain destruction the aim in electroshock therapy. Dis. Nerv. Syst., *7:* 201–04, 1946.
79. Wilcox, P. H.: Electroshock therapy. Am. J. Psychiat., *104:* 100–112, 1947.
80. Wilcox, P. H.: Shock therapy. Progress in Neurology and Psychiatry, Grune and Stratton, New York, 1947.
81. Wilcox, P. H.: Shock therapy. Progress in Neurology and Psychiatry, Grune and Stratton, New York, 1948.
82. Wilcox, P. H.: Shock therapy. Progress in Neurology and Psychiatry, Grune and Stratton, New York, 1949.
83. Wilcox, P. H.: Shock therapy. Progress in Neurology and Psychiatry, Grune and Stratton, New York, 1950.
84. Wyss, O. A. M. and Obrador, A.: Adequate shape and rate of stimuli in electro stimulation of cerebral motor cortex. Am. J. Physiol., *120:* 42–51, 1937.
85. Zubin, J.: Memory functioning in patients treated with electroshock therapy. J. Personal., *17:* 33–41, 1948.

CHAPTER XIXb

CLINICAL EVALUATION OF ELECTRIC CONVULSIVE THERAPY

LOTHAR B. KALINOWSKY

Clinical evaluation of a treatment which, for more than twelve years, has been so extensively used in all countries should be an easy task. Yet, in addition to theoretical objections on the part of some psychiatrists, there are still many differences of opinion regarding its possibilities and limitations among those who are actually using it. What should be the most objective evaluation of any treatment, the statistical approach, presents a rather confusing picture. The clinical impression of those who have a vast experience in this form of treatment and apply it adequately, shows far more uniformity as became quite evident during the discussions at last year's International Congress in Paris.

Limitation of time makes it necessary to pass over quickly those indications which are the most accepted ones. Depressions respond to a few electric shock treatments in the vast majority of cases. This applies equally to manic-depressive, involutional, old age depressions, and, with proper selection of cases, reactive or psychoneurotic depressions. There are instances where the usual number of 5 to 8 treatments is insufficient, and there are complete failures. Clinical analysis of such cases usually reveals that they did not have a pure depressive affect but rather an emptiness, listlessness or other clinical features which could have suggested that we were dealing with depressive symptoms in a schizophrenic psychosis. These patients show a tendency to relapse after approximately six days. This should not be confused with the recurrence of manic-depressive episodes which are not relapses but a new episode which again responds to a few treatments, while the depressed schizophrenic who usually relapses within a week or so, must be treated like any schizophrenic who needs a long course of electric shock or insulin treatment or both.

There is another group of depressed patients who, during the first treatments instead of getting better, show an acute outbreak of psychotic symptoms of a different nature including excitement, delusions, hallucinations. In these cases a schizophrenic psychosis had been covered up by a depressive overlay which is removed after one or two shock treatments, and which brings the acute psychotic picture to the foreground. Such cases represent

a change of symptomatology rather than an aggravation of the illness, require the same treatment as any schizophrenic psychosis, and have a fairly good prognosis. Their observation led Halpern to the formulation that ECT serves here as a diagnostic aid in schizophrenia.

There are other exceptions from the high recovery rate in depressions. For one, depressions complicated by arteriosclerotic or senile changes in the brain are unpredictable. In general, depressions in old age respond extremely well if the patient does not show clinical evidence of an organic psychosis. As far as depressive, hallucinatory or other mental symptoms in an organic, arteriosclerotic or senile psychosis are concerned, they may be removed, but the final prognosis of these cases is determined by the underlying organic damage. Arteriosclerotic admixture, accounting for a greater rigidity in the patient's mentality, often interferes with a favorable outcome. Neurotic symptoms, too, impair the prognosis of ECT in a depression. However, the majority of psychoneurotic and reactive depressions respond well to the treatment as far as the depression as such is concerned, and therefore the indication of ECT in these cases should not be questioned, even though the neurosis remains uninfluenced.

Manic episodes of a manic-depressive psychosis respond equally well if, instead of the usual three-times-a-week-routine, one or several treatments are given every day. Success might be quicker with metrazol or when the electric treatments are preceded by intravenous injection of 5 cc. of coramine as recommended by Fabing. It may be that the drug action adds a therapeutic effect of its own to that achieved by the convulsion.

ECT does not prevent future depressive or manic episodes. The impression that the free intervals become shorter in treated than in untreated patients may be valid but was never statistically proven. It is obvious that long-term follow-ups of depressions do not give better figures in treated than in untreated cases. However, such statistical conclusions are entirely misleading when we realize that untreated manic-depressive episodes generally last up to a year, while immediate treatment cuts their duration at will. In view of the patient's suffering and the potential suicidal danger it can no longer be considered justified to delay ECT in any case of depression. Here, ambulatory treatment has its greatest justification, and we regret that our general hospitals and even our mental institutions are not equipped for out-patient treatment of such cases.

Future episodes of manic-depressive psychoses can be prevented with prophylactic ECT as recommended by Geoghegan and Stevenson in all patients who had two or more episodes. One single treatment is given in monthly intervals. In a five-year-follow-up study these authors proved convincingly the effectiveness of such procedure in preventing recurrence of manic-depressive episodes. After five years they lengthen the intervals

to two months, three months and finally six months. Our own experience was equally favorable in the few cases cooperative enough to accept such treatment program. In patients with very long symptom-free intervals we are reluctant to recommend prophylactic treatment of a condition which can always be relieved by much fewer treatments than would be given with this type of long-term treatment plan. However, the great value of prophylactic treatment in manic-depressives is unquestionable.

Convulsive treatment was originally introduced for schizophrenia, and here it still has its widest application, in spite of frequently expressed doubts as to its efficacy. Most workers who apply convulsive treatment adequately, agree that results can be obtained which come very close to those achieved with insulin. Even though the clinical impression suggests some superiority of insulin in difficult cases, there are, no doubt, many instances where convulsive treatment alone is sufficient. The prerequisite for success is a long series of convulsions. We set the arbitrary figure of 20, while Cerletti himself and Lopez Ibor in his recent report at the International Congress in Paris considered 30 convulsions as an appropriate number. Good remission rates will be obtained only if such numbers are applied even in cases with disappearance of symptoms after 3 or 4 treatments. This is not contradicted by statistics that are unfavorable in spite of a high number of treatments because long series are often given to chronic cases without any response, while favorable cases are discontinued after the first improvement and consequently relapse.

The most favorable group of schizophrenics are catatonic excitements. This includes the group formerly called fatal catatonia. Such patients must be treated in spite of their often poor physical condition and in spite of the accompanying high fever and dehydration. It is a grave mistake to withhold treatment on account of the fever, or to waste time by trying first to improve the physical condition. These cases should be given two or three treatments the first day, possibly preceded by intravenous coramine. This procedure will improve both physical and mental symptoms mostly after one or two treatment days.

Catatonic stupors, generally quoted as most favorable cases for convulsive therapy, often show a poor response as far as the final outcome is concerned. It is always easy to break up the stupor even in chronic cases, but the relapse rate is invariably high, and it is this group where insulin is often indicated at an early stage.

The paranoid group of schizophrenics responds fairly well to straight ECT in the more acute cases of the younger age group, while the late paranoids, although they do not tend to deteriorate, are quite refractory to shock therapy. Simple schizophrenics show a fair response. Hebephrenics are unresponsive in the majority of cases, although shock therapy should

always be tried. The group described by Hoch and Polatin as pseudoneurotic schizophrenia shows little response to ECT, although this treatment will be frequently indicated for temporary relief of depressive episodes or panic states during the course of their illness.

I can only mention in passing the interesting attempts by Langfeldt as well as by Meduna to differentiate between schizophrenia-like conditions responding to treatment and true schizophrenia unresponsive to treatment. My personal experience does not seem to justify the acceptance of such clear demarcation lines. I also do not feel that attempts to distinguish between responsive and unresponsive symptoms were successful. They are only valid for the temporary symptomatic improvement but not for the final outcome. It can be stated, however, that what has been described as primary symptoms of schizophrenia shows little, if any response to the shock treatments. The only two prognostic factors of favorable nature for both spontaneous and treatment remissions are short duration of illness, possibly less than one year, and an acute onset of the disease.

Schizophrenics who respond poorly to ECT should always receive insulin or combined insulin-convulsive therapy. Any combination of the two types of treatment can be given. Most patients today receive first ECT which, in case of failure, is followed by an insulin combination. It should also be requested, however, that insulin failures be followed by a full course of ECT before shock treatments are abandoned.

In many cases of failure, maintenance treatment is indicated which will keep the patient outside of a hospital or, if hospitalized, permits him to work and live a more satisfactory life. The value of such symptomatic treatment which results in doing away with restraint, tube feeding and the whole sordid picture of chronic hospital wards is not yet sufficiently recognized. There is no limit to the number of well-spaced treatments, and the effect of such program on the morale of the "back wards" is enormous. By now, of course, the range of maintenance treatment will be limited by psychosurgery which should be considered whenever failure of shock therapy has been conceded.

A promising field for application of ECT is represented by psychotic reactions in organic brain disease which may respond well to a few treatments. This is true for general paresis, where the more acute psychotic picture, which often makes treatment in a general hospital difficult, can be easily removed before fever therapy or penicillin is started; also disturbing symptoms after such treatments can be removed before the etiological treatment has taken full effect. An equally good prognosis can be attributed to psychotic episodes of Parkinson's disease, where both depressive and paranoid episodes respond well. It is interesting to see in these and other neurological conditions how removal of the emotional disturbance improves

the organically impaired neurological condition and permits better functioning in hemiplegic, hemianopic, aphasic and other neurologically handicapped patients in spite of the organic damage which, of course, remains unchanged. It may be mentioned here that tics and other hyperkineses whose treatment has been tried, do not respond to ECT.

Any symptomatic psychosis as seen in many toxic or infectious diseases can be influenced symptomatically by ECT. One example may be mentioned. Recent experience with psychotic episodes during treatment with ACTH and cortisone shows that these conditions, whether manic, depressive or schizophreniform in their manifestations, can be removed by ECT. It was our impression, however, that these episodes are more resistant to therapy than many other organic reactions. I also observed a patient in whom a previous and an ACTH-produced depression had cleared up well, while a third episode occurring one year after the ACTH reaction proved unusually resistant to ECT.

Epilepsy offers some interesting indications for ECT. Spontaneous convulsions can be replaced by electrically induced seizures as demonstrated in predictable seizures like menstrual epilepsy. Such treatment, applied more widely in some English hospitals, prevents convulsions by the rise of the convulsive threshold after each electric shock treatment. More important and still too much neglected is the removal of epileptic clouded states. Also periods of moodiness, irritability and other psychiatric symptoms which often precede spontaneous seizures in epileptics can be shortened by artificially induced convulsions such as ECT.

The group in which the much deplored indiscriminate use of ECT is most frequent, is represented by the psychoneuroses. Here, shock treatments have very few indications. Neurotic reactions can even be aggravated by ill-advised ECT. Such side-effects as muscular pain or headache are added to the patient's conversion symptoms, and the temporary confusion may increase the patient's anxiety and his fear of insanity. It is in this group that permanent memory impairment is frequently claimed, although many psychological studies have demonstrated that no lasting loss of memory occurs. ECT is, therefore, particularly inadvisable in conversion hysteria and anxiety neuroses. In obsessive-compulsive neuroses occasional improvements are seen. A superiority of intense confusional or regressive ECT with several treatments a day was claimed by Milligan and also by Bini. The only favorable group of neurotic reactions is represented by psychoneurotic depressions, as has been mentioned before. Removal of a depressive affect by means of a few ECT may also facilitate psychotherapy of a neurosis, while in general my experience with patients given ECT in the hope of making them more accessible to psychotherapy, remained highly unsatisfactory.

Therapeutic value in some conditions can be attributed to blurring and euphorization which are transient organic side-effects of ECT. They may be helpful in the purely symptomatic removal of panic and other acute neurotic syndromes. They can also be used beneficially in various conditions which do not belong to the actual indications of ECT but are mentioned in scattered clinical reports. This refers to certain psychosomatic conditions, asthma, colitis, and neurodermatitis and other skin conditions in which the temporary relief from itching prevents the damaging effect of scratching and may lead to healing of the skin disease. In all these conditions, however, failure is at least as frequent as success, and the therapeutic mechanism seems to be quite different from that responsible for results in psychotics, where symptoms can disappear before any organic symptoms appear. ECT can also bring relief from pain which usually lasts as long as the blurring effect of the treatment, but according to occasional reports, it may be longer lasting in conditions like trigeminal neuralgia, painful phantom limb and others.

The clinical evaluation of a treatment would be incomplete without a few remarks regarding its complications and possible means to reduce their frequency. Fractures, the only complication that occurs often, are not predictable. As far as their prevention is concerned, the usual hyperextension of the spine is no safeguard against vertebral fractures. Moderate flexion seems preferable to me, and in some patients where I continued treatment in spite of a fracture, the patient did not complain of pain when treated in a sitting position. A more serious problem is fracture of the humerus, femur and the acetabulum, the latter being mostly bilateral and occurring during the first treatment. It appears to me that they are favored by any type of restraint of the lower extremities which should not be held at all. Fracture of the humerus seems unpredictable and unpreventable, except by the routine use of curare or curare-like substances. However, these drugs are more dangerous than the complication we want to prevent. Practically all immediate fatalities from ECT including the only fatality I ever had in more than 5000 cases, occurred in curarized patients. I am limiting its use to patients who have to be treated as a psychiatric emergency in spite of very recent fractures. The claim that any particular curare preparation affects the respiratory muscles to a lesser extent, means little because curare fatalities do not die from respiratory embarrassment which can be counteracted by prostigmine, but apparently from an unexplained central action of curare.

We are also reluctant to use routine premedication of intravenous barbiturates except in patients with postconvulsive excitement states. Their use for alleviating the patient's fear is inadvisable because they often increase the fear of a patient who had expected full unconsciousness from

such premedication. Fear of the treatment is more frequent than originally thought. Its increase towards the end of a course of treatment is probably connected with unpleasant recollection of the awakening period.

Complications other than fractures are extremely rare. Therefore, ECT has very few contraindications, and we feel that a strict elimination of all cases with some preexisting disease would not reduce the number of complications but only deprive many patients of a treatment which they may urgently need. It is an old experience that in epileptics preexisting diseases are not aggravated by their convulsions, and work with ECT has shown the same for artificially induced convulsions. Patients with hypertension, myocardial damage, tuberculosis and, of physiological conditions, pregnancy even in the last month, can be treated safely.

Unpleasant side-effects of the treatment itself are organic reactions which range from simple memory impairment, always associated with emotional changes, to severe organic reactions with Korsakoff-like pictures, hallucinatory episodes and organic dementia lasting for several days. All these symptoms are temporary and no reason to discontinue treatment but neither should they be mistaken for the disease for which the patient is being treated. They occur likewise in such modifications as electric narcosis, brief stimuli technique and others, and it may be said here that in our experience the superiority of any of the later techniques over the original method of Cerletti and Bini has not yet been proven. Clinical results have not been improved by any of them. However, they present one of the many challenging research problems which ECT still offers.

The most important task for research in the field of shock therapies is a better clinical evaluation. Their wide application is the best evidence for the progress they represent in psychiatric therapy, but comparative studies of treated and untreated cases, electric shock and insulin-treated schizophrenics, groups treated with the various modifications of ECT, and many other clinical investigations still remain to be done. Such clinical studies will be possible only in hospitals with a large number of patients, and I want to close with a plea that in this important field more research be carried out by experienced research workers on the material in our large mental institutions.

CHAPTER XX

EVALUATION OF NEWER PHARMACODYNAMIC THERAPIES

Including the Narcoanalytic Use of Drugs

PAUL H. HOCH

Pharmacodynamic therapy in psychiatry means the use of drugs to influence the emotional state of the patient. These drugs are occasionally applied alone, but more often in conjunction with psychotherapeutic procedures. In addition, a great deal of research is going on to determine to what extent physiological states can influence moods and in what way pharmacodynamics influence psychodynamics. Of the many drugs tried and later abandoned, a few are in use today which seemingly exert a marked influence on psychic states. We would first like to discuss the intravenous use of barbiturates in such treatments.

Sodium amytal interviews can be used effectively for differential diagnostic purposes. Under the influence of the drug many patients manifest a disinhibition and tendency to contact the environment. Their defenses are usually reduced and they talk more freely because they are under less emotional stress. With the drug reticent, uncommunicative, hostile patients verbalize their conflicts much better. They often admit delusions and hallucinations which they did not mention before. This is especially true for evasive and dissimulating paranoid patients. The relationship of patients to reality can be quickly ascertained. Without the drug this is sometimes difficult, especially when the patient is very anxious, depressed, or paranoid. The sexual organization of the patient under the influence of the drug can also be reviewed more easily. Incestuous wishes, homosexual preoccupations, oral, anal, sadistic, and masochistic tendencies are elicited. This method is particularly valuable in the investigation of incipient or pseudoneurotic schizophrenic patients. Typical schizophrenic reactions in such patients can often be elicited under the influence of the drug. Occasionally we can also use this method to differentiate between organic and psychogenic conditions. There are, for example, certain neurological disorders in which it is difficult to decide whether the patient is suffering from an organic or from a psychogenic condition or both, simply on the basis of the neurological evaluation. The sodium amytal interview technique is

quite valuable in ascertaining rapidly the focal points in the psychotic or neurotic structure. Under the drug sensitive emotional areas can be probed because the patient is cushioned against anxiety and depression, and because he is in a better transference relationship he will release important material more rapidly than otherwise.

It is necessary to state that the sodium amytal interview technique may not produce more material than can be obtained in drug-free sessions provided the patient can be treated for a long time. However, with the use of the drug the structure of the psychosis or neurosis of the patient can be reviewed in a much shorter time. It must also be emphasized that diagnostic work with sodium amytal is not automatic, except in rare instances. By this we mean that the simple injection of the drug will not necessarily uncover psychodynamic material. It requires skillful questioning on the part of the examiner. The ease of eliciting material depends primarily on the examiner and only secondarily on the use of the drug.

In connection with the diagnostic use of sodium amytal, the medico-legal implications of the technique should be mentioned. It is popularly believed that sodium amytal or similar drugs can be used in the form of a "truth serum" and that the person subjected to it invariably reveals all his thoughts, motives, and actions. This is not at all the case. Many persons, even under the influence of the drug, are able to withhold information. However, that which is even more important is that many are able to lie and fabricate. This is especially true of psychopathic defendants. Furthermore, under the influence of the drug many individuals are suggestible and they will accept suggestions which are improperly phrased or formulated during the questioning. Also they are often unable to differentiate between thoughts and actions. In non-legal cases such distortions of the truth are of not very great importance and are similar to those observed in the course of many psychotherapeutic treatments. Such misstatements, however, assume a different aspect if a legal situation is involved. We feel, as many others do, that drug interviews should not be admissible in medico-legal practice or only with special safeguards, and with the consent of the defendant.

Sodium amytal or sodium pentothal was used extensively in the treatment of war neuroses. Such treatments were labelled variously as narcosuggestion, narcocatharsis, narcoanalysis, and narcosynthesis. Each of these treatments uses a somewhat different technique. Basically, however, they are applied in two forms: first, the covering-up form of treatment, or narcosuggestion; and second, the uncovering type of therapy—namely, narcocatharsis, narcoanalysis, and narcosynthesis.

The first is a simple method of sedation in connection with which suggestions are given to the patient or a hypnotic technique is used. In the

uncovering form of treatment, narcocatharsis was the first method used and was based on the idea that abreaction (catharsis) facilitates the cure of a war neurosis. The techniques used here were reminiscent of early psychoanalytic techniques in which the release of repressed emotions was in the foreground of therapeutic concern. During such treatments some ask the patient to associate freely. Others attempt to elicit the traumatic experience by questioning. Usually during such a procedure the patient develops a marked emotional state and relives the anxiety, hostility, rage, guilt, and other emotional experiences connected with the traumatic situation. The same material is then reviewed with the patient in repeated interviews. The associated emotional tension is discharged and the patient gains mastery of the original situation which he was unable to cope with previously.

The narcoanalytic approach does not differ much from the above-mentioned narcocathartic method. One difference may be that narcoanalysis appears more similar to techniques used in ordinary psychotherapy. The treatment approach is less concerned with the abreactions of the patient than with the total therapeutic mechanisms involved in a transference situation. In narcosynthesis all the above techniques are used, but in addition, after the acute neurosis has been eliminated, the re-education of the patient is emphasized. This is offered mainly in terms of ego support. In Grinker's technique the drug is far less important than the psychotherapy which is given with it. In the war neuroses the superficial anxiety, hysterical fatigue, and psychosomatic states responded satisfactorily and quickly to the above-mentioned methods. In the chronic ingrained war neuroses the successful use of this technique has not been determined.

In the civilian neuroses narcotherapy is used essentially for short-term psychotherapy. It is not used, and most likely it is not suitable, for long-term techniques. However, at times during prolonged psychotherapy it is possible that the patient may need some sodium amytal—especially if his productions are meager or the material is very deeply repressed. At times it is possible to help the patient over such a hurdle, after which the original form of therapy can be resumed. It can also be used in patients who suddenly develop marked anxiety or depression during psychotherapy or in psychosomatic cases in whom marked vegetative manifestations occur. Narcotherapy interpolated in such cases permits the temporary reduction of the emotional charge. Otherwise prolonged treatment under drugs is not used at present. Unfortunately no definite agreement exists as to which type of patient can be treated with brief psychotherapy most beneficially and which with prolonged therapy. We feel that the drug techniques are able to do no more than ordinary psychotherapy with the exception that they may shorten the treatment considerably. The most suitable cases for short-term narcotherapy are patients suffering from anxiety states—espe-

cially acute anxiety states—and those from hysterical reactions. Much less responsive are cases of obsessive-compulsive neuroses, those with phobic reactions and those suffering from marked sexual maladjustments. Acute psychosomatic cases are especially suitable for this type of treatment. Some patients suffering from the pseudoneurotic form of schizophrenia in whom marked anxiety is present are also suitable, even though the therapeutic outcome is not as good as in the neuroses. However, in the frank psychoses—manic-depressive or schizophrenia—the narcotherapeutic technique does not equal in efficacy other forms of treatment used.

Short-term psychotherapy with sodium amytal, however, should not mean psychotherapy by the inexperienced with the drug compensating for lack of skill and psychotherapeutic acumen. The short psychotherapy technique with sodium amytal differs in a number of aspects from other psychotherapeutic procedures. We cannot discuss this difference here. Under the influence of amytal or pentothal euphoria is produced in the patient. There is a breaking down of the inhibitory mechanisms and therefore a more rapid establishment of transference. The drug also puts the patient in a suggestible frame of mind and demonstrates to the patient the ability of the physician to control organic dysfunctions. How this form of treatment works is not clear. Some attribute the therapeutic success to a diminished inhibition and eased abreaction. Others think that the marked suggestibility of the patient is the most important factor. It has also been postulated that some barbiturates, like sodium amytal, have a strong effect on the hypothalamus and central regulatory vegetative centers. It is believed that the quieting of this part of the brain is responsible for the therapeutic success. Others believe that sedation in general is the main factor. The reduction of stimulation and the cushioning of the patient against anxiety and tension, with their concomitant somatic manifestations and their suggestibility, are probably the outstanding features of this treatment, which otherwise is the same as other forms of short psychotherapy.

Some investigators express the fear that narcotherapy could lead to barbiturate habituation. Theoretically this is possible, but very few cases have been reported and we have not seen any habituation in patients who have been submitted to more than fifty treatment sessions.

If short psychotherapy with sodium amytal fails, this does not preclude later treatment with other forms of prolonged psychotherapy.

More recently ephedrine derivates have been used for short psychotherapy. Instead of barbiturates, intravenous benzedrine and especially pervitin have been used. Some prefer the use of these drugs to barbiturates because they feel the patient remains more alert and in better contact with the therapist. No amnesia is produced and some workers also feel that the patient is able to produce more new material than with barbiturates.

We subjected the same patient to sodium amytal and to pervitin injections at different times and found that sodium amytal normalized the patient, eliminating his anxiety, depression, and other morbid symptoms more often than did pervitin. Some patients preferred sodium amytal; others, however, preferred pervitin because in them it produced an increased feeling of mental alertness and clarity. These patients had more energy and optimism as well as feelings of increased verbal facility with a sense of normal assertiveness. They also lacked the feeling of drowsiness which is present when sodium amytal is used. Seemingly in some patients the stimulation which benzedrine or pervitin exerts is preferable, while in others the marked relaxation obtained with the barbiturates is more desirable. Which kind of patient benefits more from one or the other of these drugs is not yet determined experimentally. As to psychotherapeutic effectiveness in the production of new material—establishing transference, etc.—the differences between barbiturates and ephedrine derivates are not great.

Benzedrine, dexedrine, and drugs of similar chemical combination are used extensively as temporary stimulants in overcoming fatigue states. These drugs are able to remove the feeling of lethargy and produce a certain feeling of euphoria. They also influence the sleep regulative mechanism. Some individuals are able to function much more effectively with the drug, and do not develop any tendency to habituation. In some persons, however, this tendency develops and they usually take increasing doses of the drug. Benzedrine is useful in some depressions, especially in connection with psychotherapy. The response of such patients, however, is very unreliable; and even in those patients in whom the drug removes the depression and speeds up mental functioning, the effect wears off in a few days or a tolerance to the drugs is established.

In some lethargic, apathetic, driveless schizophrenic patients the drug exerts a beneficial influence. In other schizophrenics, however, it can lead to tension, agitation, and intensification of the psychotic symptomatology. The drug has a limited value in the treatment of behavior disorders in children and in some psychopathic adults. The somatic organization of the patient and the clinical symptomatology of the neurotic or psychotic disturbance do not give any reliable hint in determining in what way the patient will respond to these drugs. Because these ephedrine derivates produce a stimulation of the vegetative nervous system which is felt subjectively by the patient, this combination with barbiturates has become more and more established.

Mescaline and d-LSD25, a lysergic acid derivative, were also used to facilitate psychotherapy or to obtain psychodynamic material not available without the use of the drug. Some of our patients revealed new material but in many nothing new was learned. The extent to which these

drugs will be useful in therapy must be ascertained on a larger number of patients. Further investigation is definitely indicated.

Recently several new drugs were used to reduce anxiety in patients. Here we will mention only dibenamine and tolserol. These two drugs have been described as relaxants. Occasionally some patients benefit by the use of these drugs, but in general we have not been impressed by the results. In those patients in whom anxiety is reduced, it will have to be decided by careful experimentation whether the action of the drug is due to an organic interference in the metabolism of the nervous system or if it is based on suggestion. From a theoretical point of view experimentation with anti-anxiety drugs is of utmost importance. If such an anti-anxiety compound could be found, it would markedly affect psychiatric practice. At present the pharmaca used against anxiety are either sleep-inducing sedatives used in smaller amounts for anxiety control, or they are ephedrine derivates which have an anti-anxiety effect in some patients even though they are stimulants.

In connection with anxiety research we would like to mention that certain drugs instead of ameliorating anxiety have the effect of re-enforcing it. Mescaline and d-LSD25 are especially notable in this respect. These drugs markedly influence the vegetative nervous system and in addition produce symptoms which resemble schizophrenia. It is of interest that alterations in perception, bodily sensations, and changes in body image are conducive to producing anxiety, uncertainty, and at times paranoid reactions. Seemingly the perceptual alterations lead to a lowering of reality control, and then to tension and anxiety which may result in depressive, aggressive, and paranoid manifestations. Schizophrenic patients whose reality control is already impaired are apparently more vulnerable to these drugs. It is unclear whether the emotional alterations seen in these patients are due to a physiological action of the drug or psychological changes such as impaired reality control and other effects. These drug experiments indicate that a disturbance of physical and emotional homeostasis leads to a lowering of mental integration, which in turn may produce further emotional symptomatology. Barbiturates usually have an opposite effect. They foster reintegration and are even able to counteract effects of mescaline states. Such investigations will aid in clarifying many psychopathological questions and may explain some of the psychotic and neurotic symptomatology and ramifications of anxiety. At present we do not have any drug therapy which alone would eliminate mental symptoms permanently. Nevertheless, it has been demonstrated that some complex psychological manifestations may be created and abolished if we interfere with the somatic substratum of the psyche.

CHAPTER XXI

PROGNOSTIC TESTS INDICATING THE EFFECTIVENESS OF TREATMENT[1]

DANIEL H. FUNKENSTEIN, MILTON GREENBLATT AND HARRY C. SOLOMON

During the past four years, in a series of articles we reported on a test of the autonomic nervous system which has been especially useful in predicting the clinical outcome of cases treated with electric shock therapy (2, 3). Other studies with this test were reported in relation to asthma (2), loss of abstract thinking in schizophrenia (9, 10), and as a means of demonstrating physiological changes paralleling psychological changes in psychiatric patients (6).

The autonomic nervous system test was performed by studying the blood pressure changes and subjective psychological changes occurring following adrenergic stimulation (intravenous epinephrine) and cholinergic stimulation (intramuscular mecholyl). The blood pressure responses were divided into seven groups and the subjective psychological responses into four.

In 1949 (3) we reported on the correlations obtained between this test and the clinical outcome of one hundred patients treated with electric shock therapy. It was found that patients whose test results could be classified into certain blood pressure groups, viewed statistically, had a different clinical outcome following electric shock treatment than patients whose test data was classifiable into other blood pressure groups. It was also reported that the clinical outcome with electric shock treatment was poor when the intravenous injection of epinephrine was interpreted by a patient as anxiety-provoking.

This paper is principally a report of an additional series of psychiatric patients to whom the test was administered prior to treatment with electric shock. The criterion used for classifying the data derived from the

[1] The research reported in this article was made possible (in part) by a grant from the Supreme Council 33 Scottish Rite, Northern Masonic Jurisdiction, U. S. A., through the National Association for Mental Health. Lydia W. Meade, R.N., was technical assistant. Nor-epinephrine and epinephrine were supplied by Winthrop-Stearnes Co. Mecholyl was furnished by Merck and Company.

test results was the method developed in the study of the original group of one hundred cases. In this present communication two main objectives were sought: (1) reliability studies of the data (2) additional measurements which would correlate with the clinical outcome of patients with electric shock treatment.

METHOD

Subjects

One hundred and ninety-seven psychiatric patients who were routine admissions to the Boston Psychopathic Hospital form the basis of this study. All of the cases received electric shock treatment by means of the Reiter apparatus. The selection of the patients for this mode of treatment was made by the clinical director of the hospital and his staff, entirely independently of the team carrying out the physiological investigations. The decision to treat the patient by means of electric shock therapy was arrived at prior to the testing, and was not altered by the results of the test. Not all patients who received electric shock therapy were tested. Reasons for this were that some patients were uncooperative or that the work load of the laboratory was such that some patients had to be omitted. Other than these two factors, the selection was entirely random. Five patients whose treatment was interrupted by fractures were eliminated from the sample.

There were 80 males and 112 females in the study, with an average age of 35.3 years, ranging from 15 years to 60 years. The clinical diagnoses may be seen in table 13.

Administration of the test

With the patient lying down in quiet surroundings for at least thirty minutes, two hours after the last meal, the systolic blood pressure was taken by the cuff and auscultatory method by a nurse. She then injected 1 cc. of normal saline intravenously, and followed the systolic blood pressure for 10 minutes. She then injected 0.05 mg. of synthetic epinephrine (laevo-epinephrine) in ½ cc. of normal saline intravenously, and followed the systolic blood pressure until it returned to the preinjection level.

The next day under similar basal conditions, the patient was given 10 mg. of mecholyl chloride intramuscularly, and the systolic blood pressure followed for 25 minutes.

Following each drug, the patient was questioned specifically about subjective sensations, especially whether or not they had been experienced as anxiety, and if so, whether or not it was similar to his spontaneous attacks.

The tests were administered at least twenty-four hours prior to the first

electric shock treatment, and on many occasions were repeated with essentially similar results.

Measures

Following the performance of the physiologic tests as described, graphs were constructed from the data, with time as the abscissa and the systolic blood pressure as the ordinate. The basal blood pressure was drawn as a continuous line. The blood pressure reactions after epinephrine and mecholyl were recorded on the graph. The reactions to saline were not recorded

TABLE 13

The diagnostic categories and clinical outcome with electric shock treatment in relation to the autonomic blood pressure groups (second series of cases)

	GROUP											
	I		II-III		IV		V		VI		VII	
	Improved	Unimproved	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.
Schizophrenia	1	10	11	28	0	2	1	1	12	0	7	1
Manic-depressive	2	1	6	6	0	0	0	0	12	0	5	0
Involutional psychoses	0	1	3	0	1	2	0	0	25	3	2	0
Psychoneuroses	0	2	3	2	0	1	0	0	1	0	3	0
Miscellaneous	0	0	2	3	0	2	0	0	1	1	1	0

on the graph since they were insignificant. Figure 18 shows such a graph from which the following measures were obtained:

Blood pressure groups. The cases were sorted into groups on the basis of the following descriptive criteria, which, with the exception noted in the footnote were the same criteria used in sorting the original cases (3). The criteria were:

Group I

Epinephrine: Rise in systolic blood pressure in excess of 50 mm. Hg.

Mecholyl: Slight fall in systolic blood pressure with early rise above preinjection level and failure to return to the preinjection level during the 25-minute observation period (fig. 18).

Group II–III[2]

Epinephrine: Rise in systolic blood pressure in excess of 50 mm. Hg.

[2] Groups II and III were consolidated into one Group II–III. The previous descriptive classification of Groups II and III differentiated them entirely on the basis of a difference in height of epinephrine-induced blood pressure rise. If greater than 75 mm. Hg. the case was arbitrarily classified in Group II; if 75 mm. Hg or less, it was classified in Group III. Since in the majority of such cases the difference in blood pressure elevation after epinephrine was not significant, the two groups were combined.

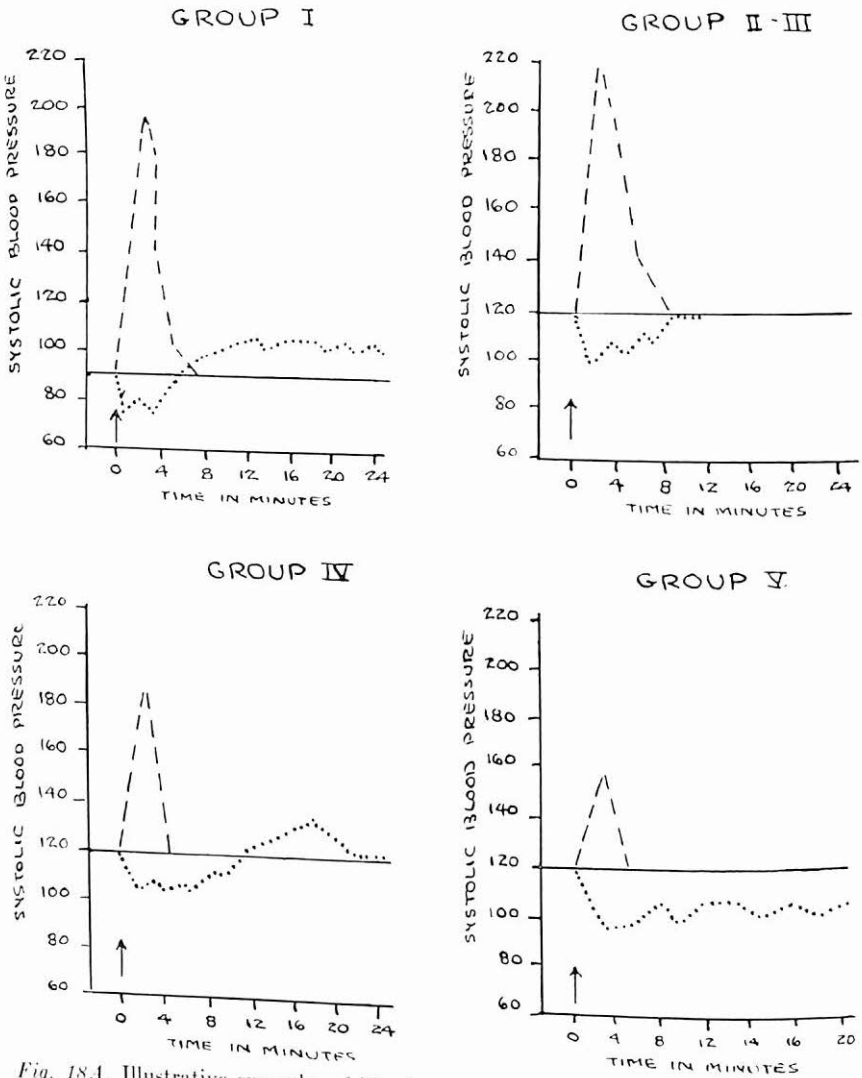


Fig. 18A. Illustrative examples of blood pressure groups I to V obtained by classifying the data obtained following the autonomic drugs.

Mecholyl: Moderate or slight fall in systolic blood pressure with or without slight rise above preinjection level but with establishment of homeostasis, i.e., return to preinjection level of blood pressure and maintenance of it, within the 25-minute observation period (fig. 18).

Group IV

Epinephrine: Rise in systolic blood pressure in excess of 50 mm. Hg.

Mecholyl: Moderate fall in systolic blood pressure with marked compensatory delayed rise before establishment of homeostasis (return to preinjection level and maintenance of it for 3 to 5 minutes within the 25-minute observation period) (fig. 18).

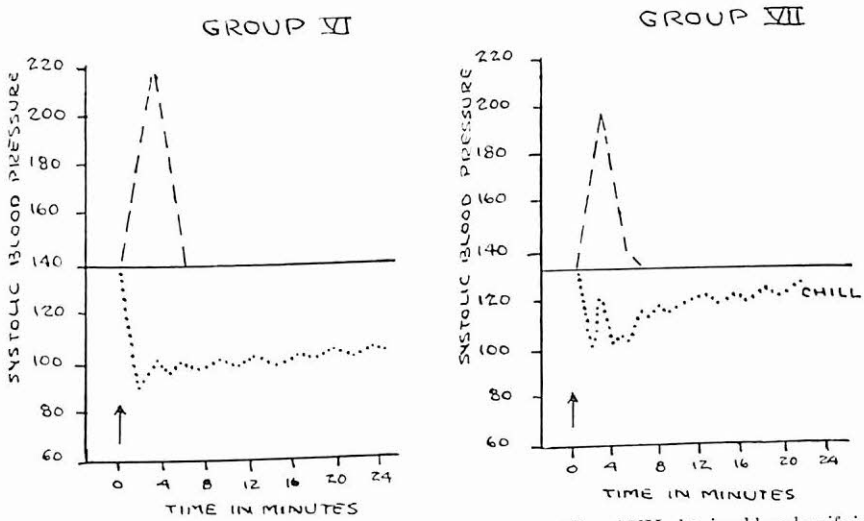


Fig. 18B. Illustrative examples of blood pressure groups VI and VII obtained by classifying the data obtained following the autonomic drugs.

Group V

Epinephrine: Rise in systolic blood pressure of 50 mm. Hg or less.

Mecholyl: Fall in systolic blood pressure with failure to reach preinjection blood pressure level within the 25-minute observation period (fig. 18).

Group VI

Epinephrine: Rise in systolic blood pressure in excess of 50 mm. Hg.

Mecholyl: Fall in systolic blood pressure with failure to reach preinjection blood pressure level within 25-minute observation period (fig. 18).

Group VII

In this group are included all cases in which a "chill" occurred after mecholyl. A reliable blood pressure curve could not be established owing to noise engendered by the muscular contractures during the chill (fig. 18).

Mathematical measures.

1. *Basal blood pressure:* The systolic blood pressure in mm. Hg after the patient had rested supine for thirty minutes, and prior to the injection of any drug.
2. *Height of blood pressure rise after epinephrine:* The difference between the basal blood pressure and the maximum systolic blood pressure reading obtained after the injection of epinephrine.
3. *Time of homeostasis:* This was the time the preinjection level of systolic blood pressure was reached following the injection of mecholyl. If it was not reached within the 25-minute observation period, it was scored "greater than 25".
4. *Area:* This was the number of squares between the line representing the basal blood pressure and the line representing the systolic blood pressure taken at one-minute intervals after the injection of mecholyl (on graph paper, with 0.25 inch squares, each square representing 6 mm. Hg systolic blood pressure and 1 minute of time).
5. *Fall:* This was the difference between the basal blood pressure and the lowest systolic blood pressure reading obtained after the injection of mecholyl.

Figure 19 shows graphically how these measures were obtained.

Diagnostic and prognostic measures. In comparing the physiologic variables with the diagnoses and clinical outcomes with electric shock treatment, the following criteria were used:

1. *Diagnostic criteria:* This was the final diagnosis made at the time of the patient's discharge or transfer from the hospital. It was made by the clinical director of the hospital, who took no part in the experimental work.

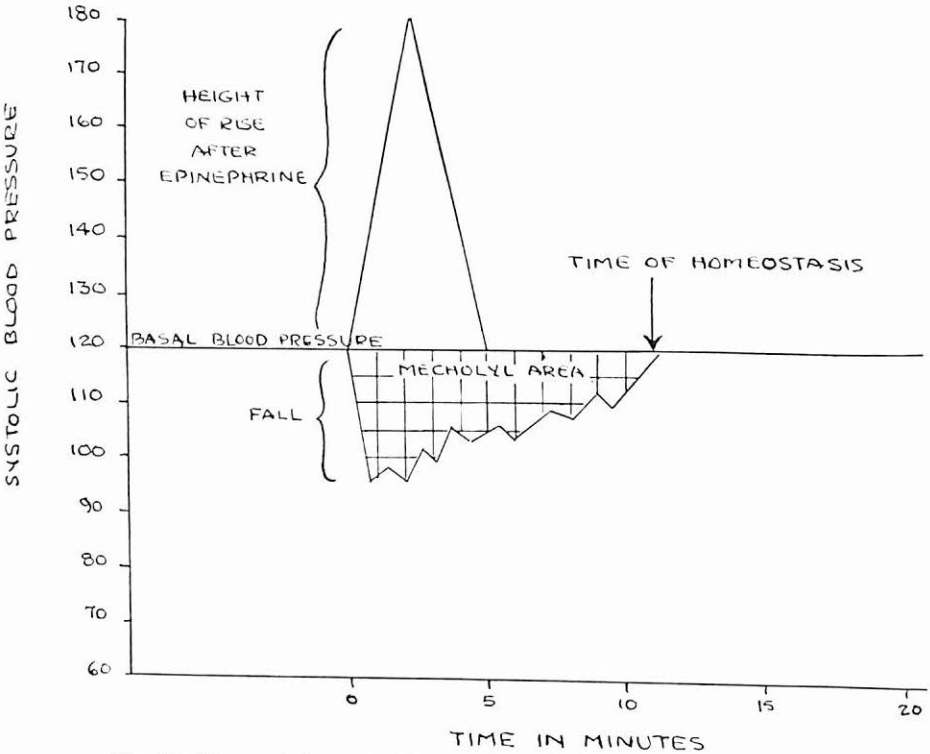


Fig. 19. The graph from which the mathematical measures were obtained.

2. *Outcome with electric shock:* Cases were marked "improved" or "unimproved" according to the following criteria:

   "Improved"—The patient left the hospital within a month of the last electric shock treatment and remained out of the hospital at least a month.

   "Unimproved"—The patient was not suitable for discharge from the hospital within a month without other somatic treatment, or if discharged returned within the month.

Type of psychophysiological response

Precipitable anxiety. This was marked as present when epinephrine alone, mecholyl alone, or both drugs precipitated anxiety in the patient.

An interpretation that anxiety had been precipitated in the patient by the drug was made when the changes induced by the drug were interpreted by the patient as anxiety similar to that experienced by the subject spontaneously at home. Confirmatory evidence in objectively seeing that the patient showed marked evidence of distress following the drug, such as marked changes in facial coloring, an appearance of fright, marked tremors, or weeping, was obtained before this measure was marked as being present.[3]

RESULTS

Relation of the clinical outcome to electric shock treatment and the blood pressure grouping

Nine cases could not be classified into the described groups, and were discarded from the sample. Eighteen cases had anxiety precipitated by either epinephrine or mecholyl, and these were analyzed separately.

The remaining 165 cases were classified into blood pressure groups. The groupings were matched with the clinical outcome with electric shock treatment (table 13). This showed a close relationship between the clinical outcome with such treatment and the blood pressure grouping. Of the 17 cases in Group I, only 3 cases, or 17.6 per cent, improved, and of the 64 cases in Group II–III, 25 cases, or 39.1 per cent, improved. In marked contrast to this, of the 55 cases in Group VI, 51 cases, or 92.7 per cent improved, and of the 19 cases in Group VII, 18 cases or 94.7 per cent improved. A Chi Square run on these results showed them to be significant at better than the 0.01 level. Insufficient cases were classified into Groups IV and V to be included in the statistical analysis (table 14).

Relation of the blood pressure grouping, diagnostic categories and clinical outcome

Table 13 shows the relationship of diagnostic category to clinical outcome and blood pressure grouping.

It was important to compare on a statistical basis the outcome with treatment within diagnostic categories. In order to do so, two additional measures were employed:

1. *Favorable groups:* Groups VI and VII, since it was found that 93.2 per cent of cases so classified were scored as "improved" after electric shock treatment (table 14).
2. *Unfavorable groups:* Groups I, II–III, IV and V, since it was found that only 32.6 per cent of cases so classified were scored as "improved" after electric shock treatment (table 14).

[3] Three types of psychophysiological responses classified in our previous paper (3) were eliminated from this study. They were: "no anxiety during the test," "anxiety relaxed by mecholyl", and "chill after mecholyl".

The cases were classified in this way, and compared with the clinical outcome with electric shock within the two main diagnostic categories studied, namely schizophrenia and the affective psychoses (manic-depressive psychoses and involutional psychoses). This clearly showed that regardless of whether the cases were diagnosed as schizophrenia or as affective psychoses, the improvement rate with electric shock treatment was much

TABLE 14

Statistical analysis of first series, second series and combined series of cases according to blood pressure grouping and clinical outcome with electric shock treatment

Group	ORIGINAL SERIES OF CASES			PRESENT SERIES OF CASES			TOTAL, BOTH SERIES OF CASES		
	Improved	Unimproved	Per cent improved	Imp.	Unimp.	Per cent imp.	Imp.	Unimp.	Per cent imp.
I	0	15	0	3	14	17.6	3	29	9.4
II–III	5	16	23.8	25	39	39.1	30	55	35.3
IV*	0	3	0	1	7	12.5	1	10	9.1
V*	0	8	0	1	1	50	1	9	10.0
VI	28	6	82.4	51	4	92.7	79	10	88.8
VII	13	0	100	18	1	94.7	31	1	96.9
	$x^2 = 45.578$			$x^2 = 58.74$			$x^2 = 104.67$		
	$N = 3$			$N = 3$			$N = 4$		
	$P < .01$			$P < .01$			$P < .01$		

* Groups IV and V excluded from x^2 due to small number of cases in these groups.

TABLE 15

Relation of diagnostic categories to clinical outcome with electric shock treatment on the basis of "favorable" and "unfavorable" groups

	FAVORABLE GROUPS		UNFAVORABLE GROUPS		x^2	P
	Improved	Unimproved	Improved	Unimproved		
Schizophrenia	19	1	12	40	30.47	$< .01$
Affective psychoses	44	3	12	10	12.51	$< .01$

higher in the cases classified on the basis of their autonomic reaction into the "favorable groups" than the improvement rate in those cases classified on the basis of their autonomic reactions into "unfavorable groups." This was statistically significant at better than the .01 level for both diagnostic categories (table 15, fig. 20).

Relation of clinical outcome and the mathematical measures

The same 165 cases used above for the statistical analysis were then sorted into "improved" and "unimproved" without regard to the blood

pressure grouping. "T" tests for the difference in the significance of the means were then run between the "improved" and "unimproved" cases, using the following measurements: the basal blood pressure, the height of the blood pressure elevation after epinephrine, and the "fall", "area", and "time of homeostasis" after the injection of mecholyl.

The cases which were scored as "improved" showed, as a whole, a higher basal blood pressure, and a greater "fall", "area", and "time of homeostasis" after mecholyl than did the cases scored as "unimproved". This

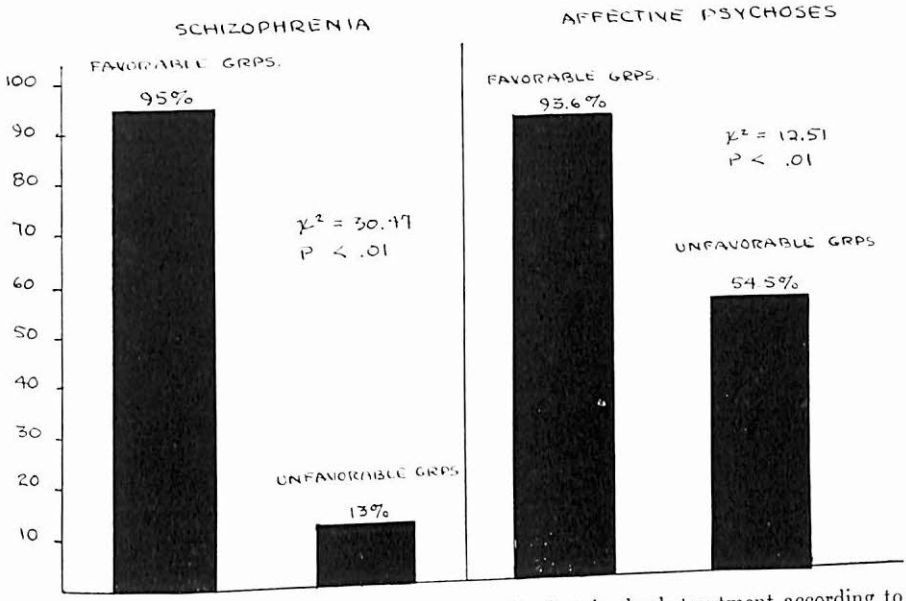


Fig. 20. Comparison of the clinical outcome with electric shock treatment according to diagnosis when the patients were divided on the basis of "favorable" and "unfavorable" groups.

was statistically significant for each of these measures at better than the .01 level. The height of blood pressure rise after epinephrine showed no significant difference between the cases that were judged "improved" as compared with those judged "unimproved" (table 16).

Reliability studies

In order to test the reliability of our results for the different blood pressure groupings, the data from the original 100 cases was prepared for analysis by consolidating Groups II and III into Group II–III for the reason stated previously. This allowed for easy comparison of the original data with that obtained in the present set of experiments. The classification of the original data into groups in comparison with the present cases may be seen in table 17.

Chi Squares were then run on a comparison of the original 21 Group II–III cases (trial 1) and the present series of 64 Group II–III cases (trial 2). A similar Chi Square was run on the original 34 Group VI cases (trial

TABLE 16

"t" test of the difference in significance of the means of the mathematical measures after the cases were divided on the basis of "improved" and "unimproved"

MEASURE	IMPROVED X	UNIMPROVED X	S	"t"	P
Systolic blood pressure	129.615	120.382	16.701	3.545	$< .01$
Height of blood pressure rise after epinephrine	77.000	78.5781	17.970	−0.5371	$.5 < P < .6$
"Fall" after mecholyl	28.1346	21.4571	10.978	3.9342	$< .01$
"Area" after mecholyl	47.1442	22.2571	31.724	5.0741	$< .01$
"Time" after mecholyl	19.4466	10.8571	7.174	7.7298	$< .01$

TABLE 17

Reliability comparison of original cases (first trial) and present series of cases (second trial)

GROUP	ORIGINAL SERIES (FIRST TRIAL)		PRESENT SERIES (SECOND TRIAL)				REMARKS
	Improved	Unimproved	Improved	Unimproved	x^2	P	
I	0	15	3	14	—	—	Fisher's exact method shows no significant difference
II–III	5	16	25	39	1.6109	$.2 < P < .3$	Insignificant
IV	0	3	1	7	—	—	Insufficient cases
V	0	8	1	1	—	—	Insufficient cases
VI	28	6	51	4	2.2666	$.1 < P .2$	Insignificant
VII	13	0	18	1	—	—	
Total cases	46	48	99	66	2.9746	$.05 < P .1$	Insignificant
Epinephrine-precipitated anxiety	3	13	9	8	4.1641	$.02 < P < .05$	Significant

1) and the present series of 55 Group VI cases (trial 2). There was no significant difference between the two trials, indicating that the original criteria for these groups were valid (table 17).

The 15 original Group I cases (trial 1) showed none "improved" and 15 "unimproved". The 17 cases in the present series (trial 2) showed 3 "improved", and 14 "unimproved". Due to the small number of "unimproved", it was mathematically impossible to do a Chi Square. Fisher's "exact" method was used and no other possible combinations giving these totals have a greater difference between the two trials than this (3/17) in the same direction. Therefore, the probability of this set of frequencies being observed in a universe in which the proportion of improved and unimproved is the same for first and second trial is 0.137, which would indicate no reason for assuming any difference between the two trials as far as proportion of "improved" is concerned (table 17).

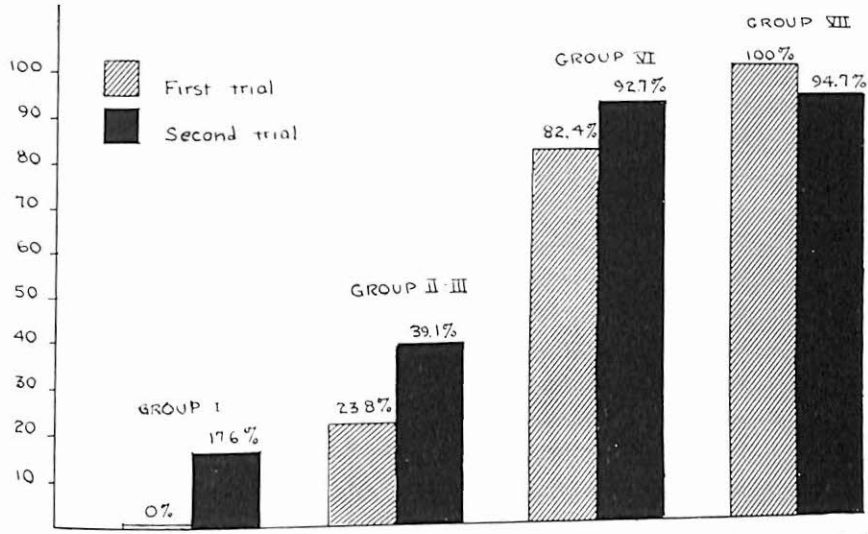


Fig. 21. Reliability study of improvement by groups, first and second trials. No statistical difference in numbers of cases "improved" or "unimproved" in each group was found between trial one and trial two.

In Group VII, in which the original cases (trial 1) showed 13 "improved" and none "unimproved", and this series of cases (trial 2) showed 18 "improved" and 1 "unimproved", the trend is so marked in one direction that statistical tests cannot be applied and are not necessary (table 17).

The above reliability studies clearly showed that the original criteria for "improvement" with electric shock established for Groups I, II–III, VI and VII were found valid and reliable when applied to a second series of cases. There were too few cases in Groups IV and V to allow for reliability studies (fig. 21).

Drug-precipitated anxiety

The cases which had this type of anxiety were analyzed separately. In the present series of cases, 17 had anxiety precipitated by epinephrine alone, 1 had anxiety precipitated by mecholyl alone, and there were none in which anxiety was precipitated by both drugs.

The case which had anxiety precipitated by mecholyl responded to electric shock treatment, as did such cases in the original series of cases.

TABLE 18

First trial and second trial of cases with epinephrine-precipitated anxiety

GROUP	FIRST TRIAL		SECOND TRIAL		TOTAL	
	Improved	Unimproved	Improved	Unimproved	Improved	Unimproved
I	0	3	1	1	1	4
II–III	0	4	1	3	1	7
IV	0	3	0	1	0	4
V	0	0	0	0	0	0
VI	1	3	6	1	7	4
VII	2	0	1	2	3	2
Total	3	13	9	8	12	21

$\chi^2 = 4.1641$.
$.02 < P < .05$.

TABLE 19

Comparison of the epinephrine-precipitated anxiety cases on the basis of "favorable" and "unfavorable" blood pressure groups

	IMPROVED	UNIMPROVED
Favorable groups (VI, VII)	10	6
Unfavorable groups (I, II, III, IV)	2	15
$\chi^2 = 9.1689$	$d.f. = 1$	$P < .01$

The 17 cases in this present series that had anxiety precipitated by epinephrine occurred with all of the blood pressure groups except V but without sufficient frequency in any one group to allow validation for individual groups (table 18).

The over-all rate of "improvement" in the present series of epinephrine-precipitated anxiety cases was 52.9 per cent (9 cases scored as "improved", 8 scored as "unimproved"), differing markedly from the original series in which the rate of improvement was 18.8 per cent (3 cases scored as "improved", 13 scored as "unimproved"). A Chi Square was then run on a

comparison of these first and second trials and found to be significant, $.02 < p < .05$ (table 17). This indicated that the original criteria for level of improvement for the cases in which anxiety was precipitated by epinephrine was not valid on the second trial.

TABLE 20

Comparison between Group VI cases with epinephrine-precipitated anxiety and Group VI cases without epinephrine-precipitated anxiety

	IMPROVED	UNIMPROVED
Group VI + anxiety precipitated by epinephrine	10	6
Group VI without epinephrine-precipitated anxiety	110	11
$\chi^2 = 8.041$	$d.f. = 1$	$P < .01$

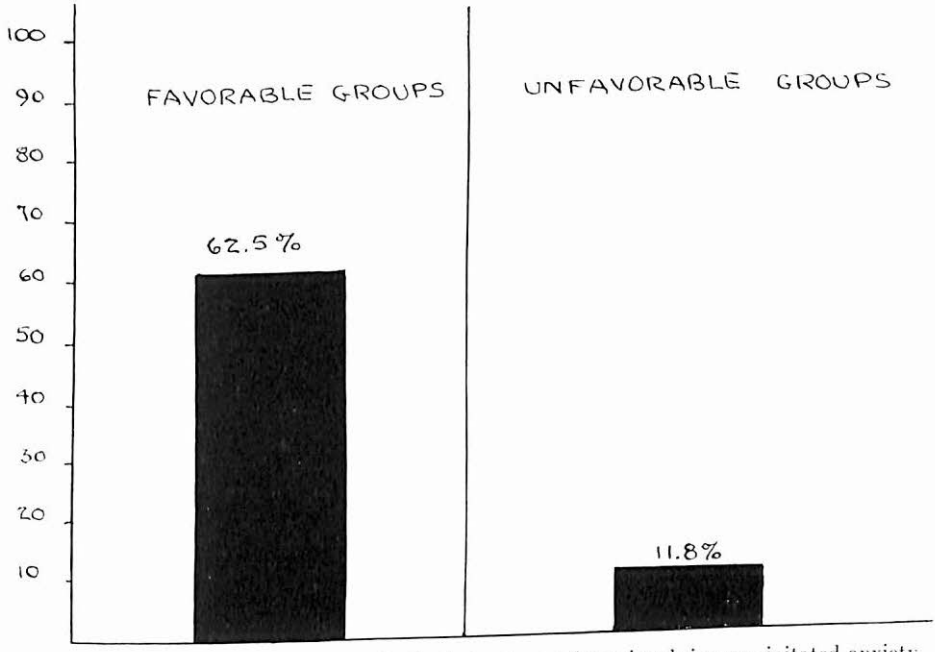


Fig. 22. Improvement with electric shock treatment for epinephrine-precipitated anxiety cases divided on the basis of "favorable" and "unfavorable" cases. $\chi^2 = 9.16$; $P < .01$.

Due to the small number of cases in both the original and present series of cases, for further analysis it was necessary to add the two series of cases together. When this was accomplished, the cases were then divided into "Favorable Groups" (VI and VII) and "Unfavorable Groups" (I, II–III, IV, V) to see if in this way a significant difference in outcome with electric

shock would be found. This showed that cases which had a combination of anxiety precipitated by epinephrine and a "favorable" blood pressure group showed a 62.5 per cent rate of improvement with electric shock treatment. In marked contrast to this, cases which had a combination of anxiety precipitated by epinephrine and an "unfavorable" blood pressure group showed only an 11.8 per cent rate of improvement, with the same therapy. This was significant at better than the 0.01 level (table 19).

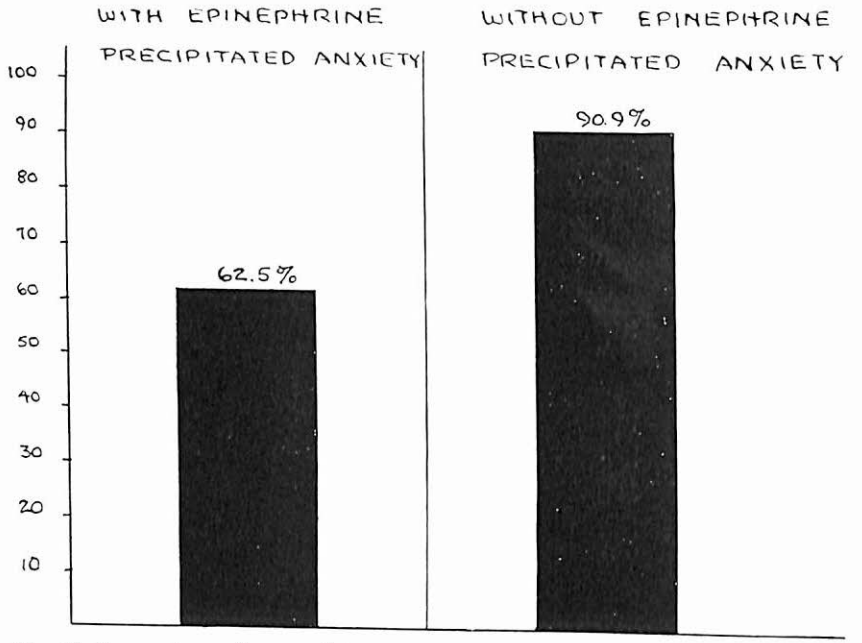


Fig. 23. Comparison of rate of improvement for Group VI cases with epinephrine-precipitated anxiety and Group VI cases without epinephrine-precipitated anxiety. $\chi^2 = 8.04$; $P < .01$.

It was now worthwhile to compare the rate of improvement of the cases in "favorable" blood pressure groups with epinephrine-precipitated anxiety, and the cases in "favorable" blood pressure groups without epinephrine-precipitated anxiety. This showed that 62.5 per cent of the "favorable groups" cases with epinephrine-precipitated anxiety were marked "improved" after electric shock treatment, whereas 90.9 per cent of the "favorable" blood pressure group cases without epinephrine-precipitated anxiety were marked "improved" after electric shock treatment. This difference was significant at better than the 0.01 level (table 20).

This data clearly showed that in cases in which anxiety was precipitated by epinephrine, in determining the rate of improvement it was necessary

to take into account the associated blood pressure grouping. Cases with this factor showed a smaller percentage of cases marked "improved" than did cases in the same blood pressure groupings which did not have this same factor (figs. 22 and 23).

DISCUSSION

This work clearly showed a correlation at a high statistically significant level between the clinical outcome of treatment with electric shock and the data derived from the blood pressure reactions following the drugs epinephrine and mecholyl. In previous communications (2, 3) we reported on a correlation between the clinical outcome with electric shock treatment and the blood pressure reactions to the same drugs. The criteria established for classifying the blood pressure reactions into groups following the drugs have been applied to the 197 psychiatric patients reported in this paper. It was important to find out whether or not the established criteria in relation to prognosis established in the first 100 cases would apply to the subsequent 167 cases. In this way, cross-validation of the results would be obtained. These studies showed that when the same criteria as to prognosis found in the first 100 cases, for Groups I, II–III, VI, and VII, were applied to the subsequent 197 cases, there was no statistical difference between the rates of improvement found for each separate group in the two trials. This indicates that the original criteria established for improvement in regard to each of these groups were valid. There were insufficient cases in Groups IV and V for cross-validation.

The original seven groups were consolidated into six groups by combining Groups II and III into Group II–III. Of the total cases, including both the original cases and the cases reported in this paper, the rate of improvement expressed in percentage was as follows: Group I, 9.4 per cent; Group II–III, 35.3 per cent; Group VI, 88.8 per cent and Group VII, 96.9 per cent. These results were found to be statistically significant at better than the 0.01 level (fig. 24). There were insufficient cases in Groups IV and V for statistical analysis.

Since the division into blood pressure groups was based on descriptive criteria, certain precise mathematical measures derived from the graphs of the blood pressure reactions were devised. These were the basal blood pressure, the "fall," "area", "time of homeostasis" after the injection of mecholyl, and the height of the blood pressure rise after epinephrine. After the cases were sorted into "improved" and "unimproved", "t" tests for the difference in the significance of the means for each of the variables mentioned above were done. With the exception of the height of the blood pressure rise after epinephrine, all measures proved to be statistically significant at better than the 0.01 level. The cases that were scored "im-

proved" showed a higher basal blood pressure, a greater "fall," "area", and "time of homeostasis" after mecholyl than the cases that were scored as "unimproved" (fig. 26).

The recovery rate with electric shock therapy bore a higher relationship to the autonomic nervous system grouping than to the diagnostic category. Within the sample, as would be expected, a larger number of manic-depressive patients recovered than schizophrenic patients. The schizophrenic patients were found in all groups with the majority in Groups I and II–III. In contrast to this, the majority of manic-depressive patients were found in Group VI. However, when the schizophrenic patient had the same au-

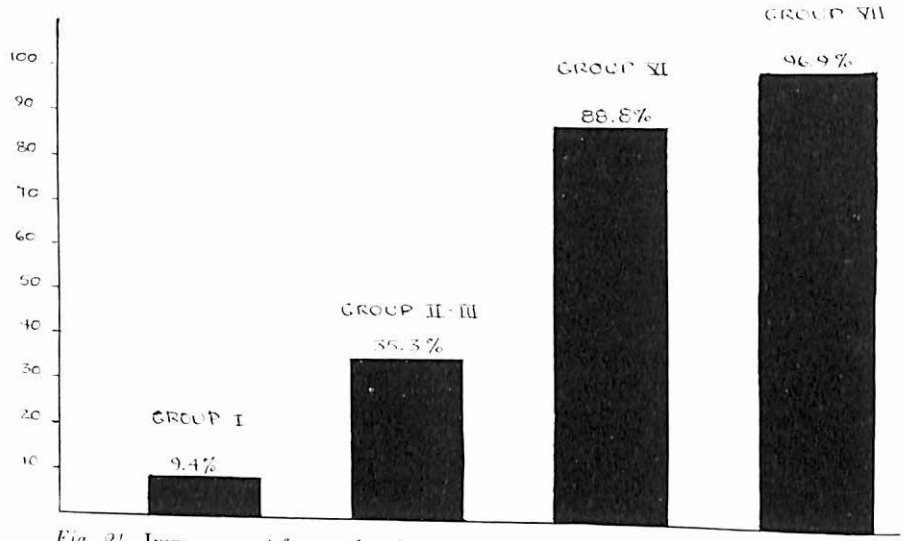


Fig. 24. Improvement for total series of cases by groups. $\chi^2 = 104.67$; $P < .01$.

tonomic nervous system group as the majority of involutional psychoses and manic-depressives, he responded to electric shock treatment also. For example, 11 of 12 schizophrenic patients in Group VI responded to shock, but only 12 of 42 schizophrenic patients who were classified Group I or II–III responded to electric shock treatment. Forty-nine of 52 of the manic-depressive and involutional cases in the shock-sensitive groups responded to electric shock, whereas only 12 of 20 such cases responded when they were in Groups I or II–III. This difference was statistically significant at better than the 0.01 level (fig. 20).

Grace, Wolf, and Wolff (7) showed that patients' reactions to autonomic drugs such as atropine, epinephrine and mecholyl varied with their emotional states. The work reported here was confirmatory evidence of their observations. The variety of blood pressure reactions following the injec-

tion of mecholyl found in our experiments differed markedly from those usually ascribed to the drug by the standard pharmacology text books. Other work of ours (5) showed that when the patient's psychological state changed, either spontaneously, or as a result of psychotherapy or somatic treatment, the patient's reaction to the autonomic drugs also changed. In our experience, college students (5) reacted quite differently to these drugs during real-life stresses than they did to the same drugs when not under stress.

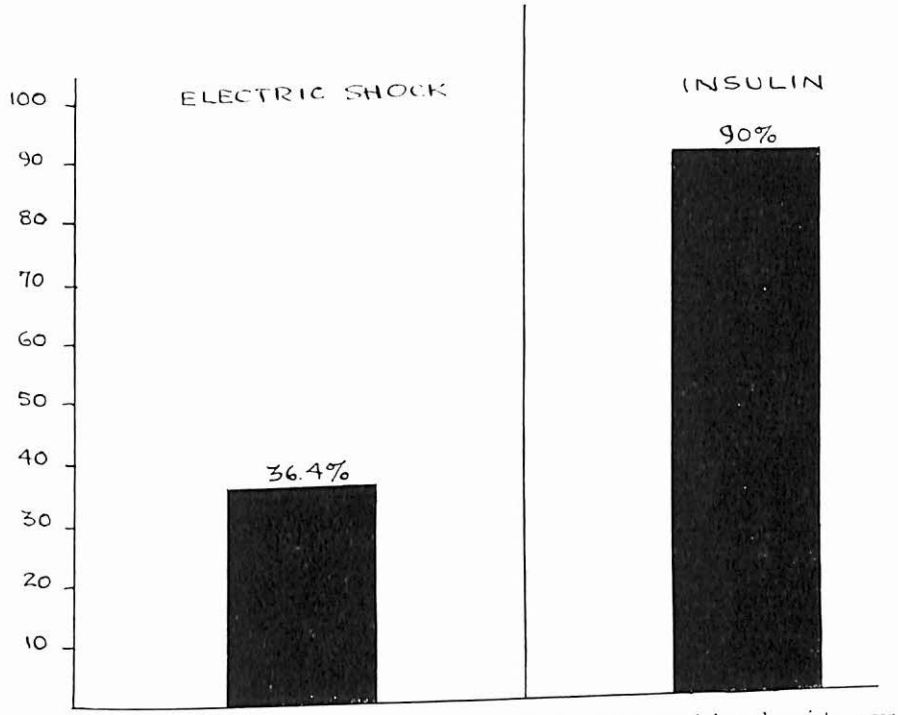


Fig. 25. Comparison between electric-shock-treated epinephrine-precipitated anxiety cases and insulin-coma-treated epinephrine-precipitated anxiety cases. $\chi^2 = 8.83$; $P < .01$.

These experiments suggested that the reaction to autonomic drugs was dependent on the psychophysiological reactions of the patients and thus related to the underlying psychology and physiology. It is probably on this basis that the reactions to the drugs of psychiatric patients were related to the prognoses with electric shock treatment.

Although much more experimental work is needed to delineate the underlying physiology and psychology, other work of ours has shown the following:

First, concerning the physiology: In experiments (4) on psychiatric

patients with elevated blood pressures two mechanisms were found to account for the elevated blood pressures. One mechanism was similar to that obtained when synthetic epinephrine was injected and the other mechanism was similar to that obtained when nor-epinephrine was injected. These reactions could be distinguished on the basis of the blood pressure reaction to mecholyl. Group VI was found to show evidence of excessive secretion of an epinephrine-like substance, whereas Group II–III showed evidence of excessive secretion of a nor-epinephrine-like substance.

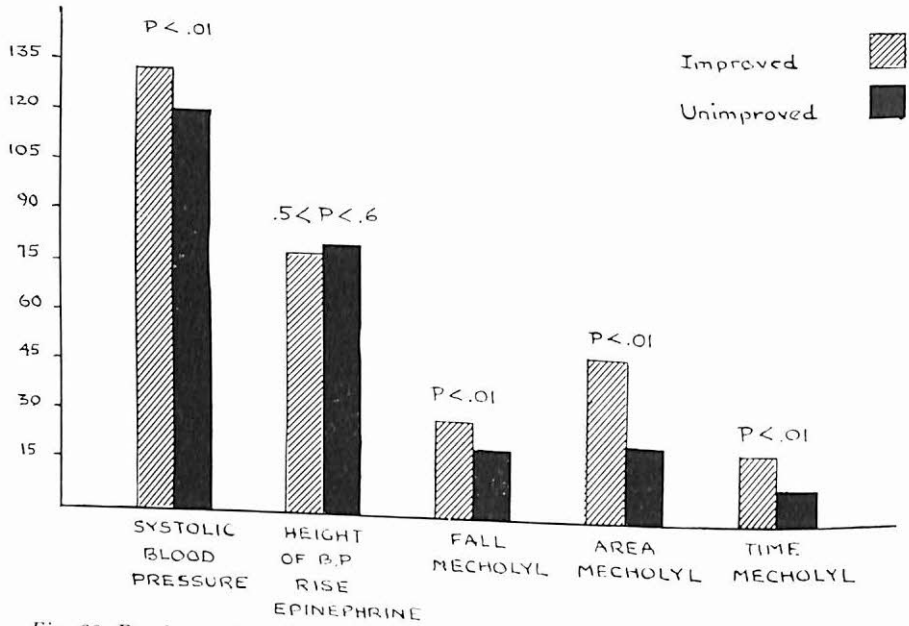


Fig. 26. Results in the "t" test for significance in difference between the means for the improved and unimproved cases on the basis of the mathematical measures.

There was a marked difference in the response to electric shock treatment of patients divided according to the evidence for excessive secretion of these substances. Ninety-two and eight-tenths per cent of patients who showed evidence of excessive secretion of an epinephrine-like substance responded to electric shock, whereas only 14.3 per cent of patients showing evidence of excessive secretion of a nor-epinephrine-like substance responded to such treatment. Unless the blood pressure was elevated there was no means of determining which adrenal medullary substance was being secreted in excess. Ax and Greenblatt (1) and Greenblatt and Funkenstein (8) found a relationship of excessive secretion of these substances to prognosis with lobotomy.

The physiology in Group I cases was interpreted as representing a "release" of the sympathetic nervous system from higher control (8).

In studies designed to elucidate the psychological concomitants of these physiological reactions, Meadow and Funkenstein (9) found that when a Group I autonomic nervous system reaction was found in schizophrenic patients, it was accompanied by poor performance on tests usually interpreted as measuring abstract thinking. In contrast to this, schizophrenic patients who had autonomic responses after the drugs classified as Groups II–III, VI, or VII showed no evidence of impairment of abstract thinking as measured by these tests. This work has since been validated (10).

Group VI cases for which physiological evidence has accumulated for excessive secretion of an epinephrine-like substance were found on a clinical basis to be depressions either of the manic-depressive or involutional type, or if schizophrenic, to show a large affective component with a depressive coloring. The hypothesis was offered that the depression in man was in some ways similar to Cannon's Fight-Flight reaction in cats, which was also associated with excessive secretion of an epinephrine-like substance. In the psychiatric patients the retroflexed anger could be the threat to the person, and insomnia, which is so often one of the prime symptoms of depression, could be explainable on the basis that when patients are mobilized for fight or flight they do not sleep (4).

Of special interest is a group of cases which we have separated from the other data. These cases have anxiety precipitated by epinephrine. In our original report (2) only a small percentage of such cases responded to electric shock therapy, and the hypothesis was advanced that cases in which anxiety precipitated by epinephrine was a factor were not apt to respond to electric shock treatment. An attempt at validation of the original criteria in regard to cases which had anxiety precipitated by epinephrine failed when these original cases were compared with those with similar phenomenon in the present series.

These cases were separated into two divisions: one in which in addition to the epinephrine-precipitated anxiety there was a shock-sensitive blood pressure group (Group VI or VII); and another division in which in addition to the epinephrine-precipitated anxiety there was a non-shock-sensitive blood pressure group (Group I or II–III). When these two groups of cases were compared on the basis of "improved" and "unimproved" a statistical difference in prognosis was found which was dependent on the underlying blood pressure group. This means that if anxiety was precipitated by epinephrine and the blood pressure group was favorable for response to shock (Group VI or VII), there was a 62.5 per cent chance of response to such treatment; in contrast to this, if anxiety was precipitated by epi-

nephrine and the blood pressure group was unfavorable for response to shock (Group I or II–III), there was an 11.8 per cent chance of response to such treatment (table 19).

It was also important to compare the rate of recovery in the shock-sensitive groups (VI and VII) with the added factor of epinephrine-precipitated anxiety with the rate of recovery in the shock-sensitive groups (VI and VII) without epinephrine-precipitated anxiety (table 20). It was found that in the former cases there was a 62.5 per cent chance of response to electric shock therapy, and in the latter group of cases, a 90.9 per cent chance of response to the same therapy. This was significant at the 0.01 level.

It is of further interest (5) that cases in which anxiety was precipitated by epinephrine and which do not respond to electric shock almost invariably responded to insulin therapy with a post-insulin treatment autonomic test showing an inability of the drug to precipitate anxiety in the patients (fig. 25).

In prognostic terms these results can be summarized as follows: Cases that fall in blood pressure groups VI and VII have a high probability of responding clinically to electric shock treatment. If such cases have epinephrine-precipitated anxiety as an added factor, the chances of responding to electric shock are significantly reduced. Insulin treatment has a high probability of helping epinephrine-precipitated anxiety cases, particularly in reducing the anxiety. If the patient's autonomic reaction is classified into Groups I or II–III, the chances of responding to electric shock treatment are small, and are further reduced if epinephrine-precipitated anxiety is an added factor.

Patients who are classified into blood pressure groups II–III, VI and VII usually show no impairment in abstraction, in contrast to Group I cases, in which impairment of abstraction is usually found.

The majority of Group VI cases show evidence of excessive secretion of an epinephrine-like substance, and those in Group II–III (if blood pressure is elevated) show evidence of excessive secretion of a nor-epinephrine-like substance. The physiology in Group I cases has been interpreted as representing a "release" of the sympathetic nervous system from higher control. If the patient falls into Group I and has an impairment in abstract ability, the chances of recovery are quite small.

It follows that the diagnoses have perhaps less validity than do the autonomic responses in determining the clinical outcome with electric shock therapy. As would be expected, the majority of affective psychoses fall into Group VI, and probably the majority of hebephrenic schizophrenic cases into Group I. A few cases which are diagnosed schizophrenic and which fall into Group VI have a good outcome with electric shock treatment.

With this data, it now seems worthwhile for a clinical trial of the test in predicting the clinical outcome of cases treated with electric shock. It would seem that further work in the direction of refining the psychological concomitants of these reactions would increase the accuracy of the test and an understanding of the psychophysiology of psychiatric patients.

SUMMARY AND CONCLUSIONS

1. Additional studies of a test of the autonomic nervous system which we reported on previously were made. On the basis of the blood pressure reactions obtained following adrenergic stimulation (intravenous epinephrine) and cholinergic stimulation (intramuscular mecholyl), the data were classified into six groups. An additional factor studied was whether or not the drugs precipitated anxiety in the patients. In addition, five new mathematical measures not used by us previously were studied.

2. All of the above data were correlated with the clinical outcome of patients treated by means of electric shock therapy with the following results:

Blood pressure groups

Group I	9.4% scored as "improved"
Group II–III	35.3% scored as "improved"
Group VI	88.8% scored as "improved"
Group VII	96.9% scored as "improved"

Groups IV and V provided insufficient data for statistical analysis, but the trend was in the direction of a low rate of improvement for each group. For Groups I, II–III, VI and VII these results show significance at better than the 0.01 level. Reliability studies showed that the original criteria were valid.

Mathematical measures

Associated with "improvement":
High basal blood pressure.
After mecholyl: Large "area"
Large "fall"
Long "time of homeostasis"

Associated with "unimprovement":
Low basal blood pressure.
After mecholyl: Small "area"
Small "fall"
Short "time of homeostasis"

All of these measures show significant difference between the means of the "improved" and "unimproved" at better than the 0.01 level. Height

of blood pressure rise following epinephrine bore no statistical relationship to prognosis.

Precipitable anxiety

Anxiety precipitated by epinephrine alone:

Over-all rate of improvement	36.4%
With B.P. Groups I, II–III, IV	11.8%
With B.P. Groups VI, VII	62.5%

These results are significant at better than 0.01 level.

Anxiety precipitated by mecholyl alone:

Insufficient cases for statistical analysis, but trend in direction of recovery.

Anxiety precipitated by both drugs:

Insufficient cases for statistical analysis or trends.

3. The physiological indices had a higher relationship to the clinical outcome in patients treated with electric shock therapy than did the diagnostic categories.

4. Previous work reported by us elucidating some of the psychology and physiology underlying the drug reactions was discussed.

BIBLIOGRAPHY

1. Ax, A. F. and Greenblatt, M.: Physiological changes following frontal lobe surgery in chronic mental illness. Proc. Boston Soc. Neurol. & Psychiat. (in press).
2. Funkenstein, D. H.: Psychophysiologic relationship of asthma and urticaria to mental illness. Psychosom. Med., *12:* 377, 1950.
3. Funkenstein, D. H. Greenblatt, M. and Solomon, H. C.: A test which predicts the clinical effects of electric shock treatment on schizophrenic patients. Am. J Psychiat., *106:* 889 1950.
4. Funkenstein, D. H., Greenblatt, M. and Solomon, H. C.: Autonomic nervous system changes following electric shock treatment. J. Nerv. & Ment. Dis., *108:* 409, 1948.
5. Funkenstein, D. H., Greenblatt, M. and Solomon, H. C.: Nor-epinephrine-like and epinephrine-like substances in psychotic and psychoneurotic patients. Am. J. Psychiat., *108:* 652, 1952.
6. Funkenstein, D. H., Greenblatt, M. and Solomon, H. C.: Autonomic changes paralleling psychologic changes in mentally ill patients. J. Nerv. & Ment. Dis., *114:* 1, 1951.
7. Grace, W. J., Wolf, S. and Wolff, H. G.: The Human Colon. N. Y., Hoeber, 1951.
8. Greenblatt, M. and Funkenstein, D. H.: Effect of frontal lobe surgery on reaction to an autonomic drug (mecholyl) (in preparation).
9. Meadow, A. and Funkenstein, D. H.: The relation between abstract thinking and the status of the autonomic nervous system in schizophrenia. Proc. Am. Psychopathologic Soc., 1950 Grune & Stratton, New York, 1952, cpt. 8, p. 131.
10. Meadow, A., Greenblatt, M., Funkenstein, D. H. and Solomon, H. C.: Relation between abstract capacity in dementia praecox and physiological response to an autonomic drug (mecholyl). J. Nerv. & Ment. Dis. (in press).

SUMMARY OF PAPERS XVIII TO XXI

FRANCIS J. BRACELAND, *Hartford, Conn.*

One thing characterizes this group of papers, as it did yesterday, and that is the calm dispassionate evaluation of results as the essayists objectively report their findings.

Dr. Hughes examines insulin therapy since 1946 following upon the work of Hoch and Kalinowsky, and he classifies their report as the classic monograph on the subject. The important statistics he quotes are those of the Pennsylvania Hospital, in which a 37 per cent recovery rate in insulin treated patients held after five years, while the recovery rate and much improved rate in patients without insulin therapy was only 16 per cent. Inasmuch as his organization, the Pennsylvania Hospital, has been giving insulin shock treatment since 1936, we will soon have more conclusive evidence from them as the time for a fifteen-year follow-up evaluation will soon arrive.

He notes that Lipschutz reported a 53 per cent recovery rate, which he claimed was only 9 per cent greater than the recovery rate of his control series. That certainly is a disparity and needs further investigation.

Other highlights of Dr. Hughes' paper were: his insistence upon the clarification of diagnostic criteria, his quoting of Cohen's figures showing that patients ill less than one year have twice the recovery potential of the others, and his interesting observation that a weight gain of 30 pounds in a patient means that he will do twice as well as those whose weight gain is less and that weight loss prior to treatment gives a greater potential for recovery.

He concludes that insulin therapy is a useful procedure and one of the major resources of the psychiatrist in the treatment of schizophrenia. Still the treatment is not specific and no new knowledge of the mode of action has been brought forth. His insistence that the therapy not be divorced from psychotherapy is well taken.

Dr. Liberson's paper is interesting for many reasons and too complicated to discuss in the allotted one minute which we have here. Simply because we have available various types of electric shock therapy which work more or less effectively, and by a largely unknown rationale, there is no reason to be complacent about its use. The many undesirable clinical side effects, some of them unpredictable, must have evoked in many clinicians a wish for safer and more reliable methodology of treatment.

Despite the fact that this is a problem eminently open to experimentation, there has been relatively little careful work done on it until the present time, and therefore Dr. Liberson is to be congratulated for his efforts to bring some ordered data to bear on the problem.

As one looks at the situation objectively, it is indeed unlikely that the available domestic electric current that we use in our toasters and electric blankets should approximate the optimum current used in the treatment of mental disease. The many experimental animal studies dealing with electric stimulation of the brain and the numerous observations made on intact exposed human cortex, some of which will be reported here today, make it abundantly clear that an entirely different set of parameters of stimulation should be explored for therapeutic significance.

Dr. Liberson demonstrates in his paper that a sharp reduction may be made in the total electrical energy used in treatment, and this, of course, should reduce some of the hazards of therapy.

Dr. Kalinowsky passes over the ordinarily accepted indications for treatment, that is, he notes that they are well accepted, and goes on to make several interesting observations concerning depressive symptoms in schizophrenic psychoses and he notes that these show a tendency to relapse. In fact, some of these patients relapse after a period of about six days, and he believes that these cases need a longer course of ECT or insulin, or both.

He calls attention to another group which gets worse after the first treatment, notably those in whom the schizophrenic psychosis is covered up with a depressive overlay, and he states the first shock treatments unearth the schizophrenic symptoms. This fact led Halpern to the formulation that electric shock therapy aids in the diagnosis of schizophrenia.

Dr. Kalinowsky calls attention to the fact that manic episodes should be treated with several treatments daily as there is much more likelihood of success in this manner. There is also merit, he says in giving electric shock therapy preceded by intravenous injections of 5 cc. of coramine, as described by Fabing.

Interestingly enough, he states that long-term follow-up of depressions does not give better figures in treated than untreated cases, but treated cases are definitely terminated much more quickly. Electric shock therapy is justified because the length of hospital stay is reduced and also the risk of suicide is lessened.

Kalinowsky mentions favorably the prophylactic treatments with electric shock, as outlined by Drs. George A. Stevenson and Geoghegan. Convulsive treatments, he states, originally were introduced as treatment for schizophrenia, and he believes, in spite of the doubts of others, that its widest application still lies in this field. He compares EST favorably with insulin and calls attention to the fact that a prerequisite of success is a long-term treatment. He recommends twenty while Cerletti advises thirty

treatments. He thinks that these are necessary even though the good results appear after three or four treatments.

The catatonic stupors often show poor response, he states, and here he thinks insulin is indicated at an early stage. Paranoids, he finds, respond fairly well, especially the young acute ones. He feels that simple schizophrenics show a fair response while hebephrenics are rather unresponsive, and that the schizophrenics who respond poorly to electric shock therapy should have insulin afterwards before shock therapy is abandoned.

Dr. Hoch finds that in amytal interviews the eliciting of material depends more on the skill of the examiner than it does on the use of the drug. Many people are able to withhold information or even to lie while under narcosis, this being true also in hypnosis, and therefore he questions whether or not this information obtained in this manner should be admitted medicolegally.

In civilian neuroses, narcotherapy is used essentially in short-term therapy, and might help the patient over a hurdle. More recently, epinephrine derivatives have been used for short-term psychotherapy. Various other medications, especially pellotine, has been used, but the type of patient who should get this has not yet been determined. He mentions mecholyl and LSD 25, a lysergic acid derivative, but still cannot evaluate them as to their aids in therapy. At present no drug therapy that we have will eliminate mental symptoms permanently.

The paper of Drs. Funkenstein, Greenblatt, and Solomon is a very carefully reasoned, long paper, twenty-one pages, with eight graphs, in the copy which I saw, and it would not be fair to try to evaluate it here. It is a continuation of their excellent work on tests of the autonomic nervous system. They have been able to prognosticate the clinical outcome in some cases treated with electric shock therapy. They also report that the clinical outcome with electric shock therapy is poor when the intravenous injection of epinephrine is interpreted as an anxiety-producing mechanism.

In this paper they are trying to seek reliability of data and other measurements which will correlate with clinical outcome of patients with EST. The 197 cases which they discuss are a good indication of the way they are going about it, and they promise now to go into a more extensive clinical trial.

The work shows a correlation at a high statistical level between the clinical outcome of treatment with electric shock therapy and data derived from blood pressure reactions following the drugs epinephrine and mescaline. I would need a great deal more time to discuss the details, and I have been limited to five minutes.

DISCUSSION

Dr. John Romano [Rochester, N. Y.]: May I ask Dr. Kalinowsky whether he is able to tell us something of the actual incidence of fractures in ECT—fractures of the spine and nonspine—in terms of incidence per number of treatments and incidence per number of

patients, and also whether there was any disparity between incidence in those instances in which careful x-rays had been taken before and after and in those in which such studies had not been done?

PRESIDENT WORTIS: Dr. Kalinowsky, we have several questions for you from the floor. One, from Dr. J. C. Yaskin, reads: "What has been the effectiveness of EST in treatment of patients suffering from severe pain due to malignancy complicated by depression? In my experience in several cases the pain persisted despite confusion."

Dr. Gahagan asks: "Do you know of any case of encephalitis (of unknown origin) with psychotic symptoms which has been helped or made worse by electric convulsive therapy?"

Another question reads: "How do neurotic equivalents of manic depressive psychoses respond to electric convulsive therapy?"

DR. LOTHAR B. KALINOWSKY: The answer to the first question, regarding the percentage of fractures, is that in my opinion the frequency of positive x-ray findings depends upon the skill of the x-ray specialist who reads the pictures. This explains the more than 40 per cent fracture rate in the metrazol group where the x-rays were studied by the late Dr. Dyke. The present figures are approximately 15 per cent in electroshock treatment, many of which do not even have backache. We got more and more away from the feeling that the vertebral fractures are anything very serious, and follow-ups have shown that they never have any serious sequelae. However they are not preventable. There are new techniques, for instance, the "glissando" technique, for which claims are made that fractures are less frequent. At the Psychiatric Institute, Dr. Horwitz compared our fracture rate of groups treated with and without the glissando technique, and found that the fracture rate for the glissando technique was even higher. I don't think that means too much, but it shows at least that the glissando does not prevent fractures.

The fractures of the long bones are, of course, a serious complication. I think I had six or seven fractures of the femur and humerus in a group of six or seven thousand patients. That would be one out of a thousand patients approximately. In none of those cases was I able to find out why the particular person had a fracture.

As to the question regarding the pre-treated x-ray studies, they are valueless because there is no condition of the spine, for instance, which has anything to do with the probable occurrence of fractures. I have treated many patients with severe curvatures of the spine, patients with arthritic changes, and patients shortly after a laminectomy, and never had any trouble with those cases. Where I had injuries they were always entirely unpredictable.

The next question concerned the effect of ECT on severe pain. Pain can usually be removed temporarily by electric shock. I must say I never used ECT for the relief from pain alone because it is not reliable and usually lasts only a week or so, as long as the organic blurring effect of electric shock is present. There are, however, some reports in the literature, where trifacial neuralgia has disappeared lastingly by electric shock. In 2 such cases when I tried to substantiate these reports I was unsuccessful.

I did mention that psychotic episodes in the course of such neurological conditions as Parkinsonism and post-encephalitis respond well to ECT. As to the last question regarding "neurotic equivalents" of manic-depressive psychoses, such cases, however we want to classify them, usually clear up under a few ECT.

DR. J. LAWRENCE POOL [New York, N. Y.]: May I ask Dr. Liberson if he would be kind enough to define the degree, duration, and type of autonomic changes after the various types of electric shock therapy that he described?

PRESIDENT WORTIS: We have several questions for Dr. Liberson.

One, from H. E. Rosvold, reads: "Dr. Liberson stated that the brief stimulus technique was effective principally at the cortical level while the conventional technique was effective principally at subcortical levels. His psychological evidence (if I understand correctly) is to the contrary. Does he have specific evidence for this differentiation?"

Dr. Robie poses this one to you, Dr. Liberson: "In his list of secondary physiological effects, Dr. Liberson makes no mention of greater degree and more severe cyanosis—sometimes of almost moribund degree—which occurs with the brief stimulus apparatus now being used. When there are other electrostimulatory machines available which do not cause such a severe degree of cyanosis and which simultaneously stimulate respiratory response immediately following the convulsion, is it not better for the psychiatrist to use these seemingly safer methods of producing seizures?"

Dr. A. Earl Walker [Baltimore, Md.]: I should like to ask Dr. Liberson if the period of post-stimulation depression or extinction is longer after stimulation of the temporal than of the motor area, other conditions being the same.

Dr. W. T. Liberson: I should like to thank Dr. Braceland for his comments.

Dr. Pool asked me to comment on the degree and type of autonomic changes in different types of electric convulsive therapy. The main difference between the response to conventional types of therapy and the brief stimuli or other milder forms of convulsive therapy is a quantitative one. The autonomic changes, such as, the pupillary, the vasomotor and pilomotor changes are more pronounced with the classical therapy than with the brief-stimuli therapy. However, when the brief stimuli current is applied for a longer period of time at a subconvulsive level, the autonomic effects may be very pronounced. We may stress again the presence of isolated loss of consciousness with the classical current of brief duration and its absence with the brief stimuli technique. It is this phenomenon which is responsible for differences in the degree of amnesia.

Dr. Walker asked me about the differences in the convulsive pattern elicited by the motor and temporal cortices. The conditions of the experimentation on patients as it can be carried out in psychiatric hospitals do not permit one to give a definite answer to this question. But we had the opportunity with Dr. Scoville and Dr. Dunsmore to stimulate directly different cortical areas in patients under local anesthesia. The main difference in the convulsive pattern was that when we stimulated the uncal region, the first response was suspension of respiration, and the convulsion occurred much later. When we stimulated an area close to the motor cortex, an apnea occurred simultaneously with the convulsion.

Dr. Robie mentioned the greater degree of cyanosis occurring with brief-stimulus therapy. I must say that when I refer to the brief-stimulus therapy, I do not refer to any particular machine. What I am talking about are the differences produced by different forms of current. The machines I suppose Dr. Robie is referring to produce a current which includes brief stimuli. I have not observed in my patients any outstanding degree of cyanosis. As Doctor Robie states, when cyanosis does occur one may stimulate the respiratory movements with brief stimuli, and this can be done with any machine which produces currents of low intensity.

Now, there was another question which I could not hear.

President Wortis: Dr. H. E. Rosvold sent up the following question: "Dr. Liberson stated that the brief stimulus technique was effective principally at the cortical level while the conventional technique was effective principally at subcortical levels. His psychological evidence (if I understand correctly) is to the contrary. Does he have specific evidence for this differentiation?"

Dr. Liberson: Well, I do not know what you mean by contrary psychological evidence.

This is what happens under the experimental conditions of the electric-shock therapy: When one moves the electrode from the motor area to the fronto-temporal area, one has to increase the current. I presume, therefore, that when the stimulation was done over the motor area with brief stimuli, I stimulated the motor cortex. The differentiation between the effects of the stimulation of the motor and the uncal areas can be made much better by direct stimulation of these areas during lobotomies, research to which I referred a few moments ago. The more pronounced involvement of the subcortical structures in the case of the conventional technique is a matter of speculation based on the observation of more profound loss of consciousness than when BST is used.

Dr. Oskar Diethelm [New York, N. Y.]: May I ask Dr. Hughes whether in his experience at Pennsylvania Hospital patients who were refractory to insulin treatment nevertheless showed therapeutic results, and whether they have made progress in overcoming the patients' inability to react physiologically to the insulin?

President Wortis: We have had sent up from the floor the following question: Dr. Hasselbacher asks Dr. Hughes if he would "please compare or comment on results in schizophrenia using deep coma and subcoma insulin treatment."

Dr. Joseph Hughes: There are no data that permit a statistical comparison between the results of deep coma or subcoma insulin therapy. The potential for spontaneous recovery in patients treated with subcoma therapy is apparently so great and so favorable that the results for recovery range in the 85 to 95 per cent level as compared to the much lower percentage of recovery seen in patients treated with deep coma. One could say that the differences in recovery rates reflect the results seen in patients who were less seriously ill as compared with patients who were more seriously ill.

The response in patients who do not develop a coma reaction has not been favorable.

President Wortis: Dr. Hoch, here is one question for you: "Have you any experience using combined amytal and benzedrine intravenously?"

Dr. Paul H. Hoch: Dr. Braceland mentioned that mescaline and pervitin are also used for therapeutic purposes. We feel that the therapeutic use of these drugs will have to be evaluated further. At present no final statement can be made about them.

Dr. Rado raised the important question whether addiction occurs when intravenous barbiturates are used in conjunction with psychotherapy. Due to the limited time I omitted to read the paragraph in my paper pertaining to this use. Some investigators expressed the fear that narcotherapy could cause addiction. Actually there are very few patients that I have observed who became habituated to barbiturates when the barbiturate was applied intravenously. It is rather interesting that barbiturates which are given orally in increasing doses produce much more habituation than if the drug is given intravenously. Nevertheless the relaxing effect of the drug given intravenously is much more marked. I think that this is in contrast to other addicting drugs.

In regard to the other comment of Dr. Rado, it is necessary to differentiate between the so-called sweetening drugs and true drugs for controlling anxiety. Of course, we do not yet know in every instance what a sweetening drug is and what a true anxiety controlling one is. Anxiety is a very important problem in psychiatry and our physiological knowledge is lagging behind our psychodynamic knowledge. We are also slowly catching up on a biochemical and physiological level, but if our knowledge in this field would increase, I am thoroughly convinced that it will markedly transform the present practice of psychiatry.

As to the question about intravenous benzedrine and amytal being given simultaneously, we have done this in some cases. I do not believe that it offers anything superior to the use of either of the drugs alone with the exception of a few cases.

Section VI

CHAPTER XXII

THE ROLE OF ACTH, CORTISONE AND HYDROCORTISONE IN THE PROVOCATION OF CERTAIN PSYCHOLOGIC RESPONSES

HOWARD P. ROME AND FRANCIS J. BRACELAND

The experimental and clinical use of ACTH, cortisone, hydrocortisone and certain other steroids of the Δ^4 pregnene series during the past several years has provided an opportunity to observe the psychologic changes which are induced by the various resulting metabolic alterations in the anterior pituitary-adrenocortical adaptive mechanisms. A correlative investigation of pseudohermaphroditism and Addison's and Cushing's diseases, as spontaneous variants in adrenal cortical function, has permitted a simultaneous study in contrast and comparison, which has added an important dimension to these observations.

Our previous reports (1–4) have been summaries of the more descriptive aspects of these investigations. They comprise a frame of reference for subsequent reports, of which this is the first. These will present the dynamic aspects of the psychologic responses which have been observed. The responses of the patients have been grouped in four categories. The less pronounced changes, which are evidenced primarily in the sphere of mood and affect, have been placed in groups 1 and 2 according to gross quantitative criteria. Those responses which appear clinically to be indicative of a more comprehensive change involving the spheres of ideation and behavior, as well as that of affect, have been placed in group 3. Group 4 is composed of all those responses which indicate changes in the structure of the ego which are clearly of a psychotic proportion.

As Hartmann (5) has observed, the ego is man's special "organ" of adaptation. In this connection it is significant that all four groups of responses demonstrate, in a roughly quantitative clinical fashion, effects of varied intensity on the adaptive resources of the ego. It is one aspect of this effect on the organization of the ego which led the original investigators (6) of ACTH and cortisone to refer to the "euphorogenic" effect of cortisone. Subsequent detailed studies indicate that the variations in mood which are

seen frequently are but one aspect of a widespread change in the structure of the ego, often of a subtle nature.

Since it is obvious that the total adaptation of the organism is dependent on both internal and external environmental influences, it follows that any change in the steady state of the internal environment in itself may constitute a stressful experience of greater or lesser magnitude, reflected in alterations of the many functions of the ego and hence potentially provocative of clinically observable reaction formations. The disruption of the existing steady state of ego function occasioned by the administration of these hormones mobilizes ego defense mechanisms, the homeostatic controls of psychologic function, in an attempt to minimize the dislocating influence of the stress. This is a mode of adaptation comparable to the physiologic function of all other systems. The final level of adaptedness which is achieved, in this instance the new steady state characteristic of the ego, is a function of two variables: the magnitude of the dislocating stress and the adaptive capacities of the ego.

It appears that the total dose and the total amount of hormone used, as well as the rate at which the daily dose is increased or decreased, bear a direct relation to the psychologic responses observed. Then too, in this equation there are those specific parameters on which the particular patient's ego-syntonicity depends. These include primarily the basic organization of his character structure. Of secondary importance are factors altering its stability, such as the patient's status immediately before treatment, the chronicity of the underlying disease from which he suffers, the extent of the disability imposed by symptoms such as the amount and nature of the pain experienced, the attitudes of family and attending physicians, and the like. In appreciation of the prepotence of the foregoing, it is evident that the psychologic responses which are observed are determined in the largest measure by what has been termed the mutability of the ego. It almost goes without saying that the unconscious antecedents of this personality structure have an important preforming role.

Investigations of a theoretic nature on the structure of the ego warrant the assumption that physiologic influences mediated by hormonal changes of different magnitudes have a pronounced effect on ego relationships. Freud (7) described the normal restriction of the ego in young girls incident to the process of femininization at the menarche. Anna Freud (8) has pointed out, in a more detailed discussion of ego defenses, the shifts in cathexis which are conditioned by the physiologic process at puberty. Benedek and Rubenstein (9), in a coordinated physiologic and psychologic investigation, described what Benedek (10) termed, "the close and unbroken response to the physiological stimuli originated by the ovarian hormones." In a subsequent study on the climacterium, Benedek (10) noted that "inadequate

production of hormones may be perceived as a lack of libidinous emotions, causing a sense of frustration from within." Hartmann, according to Fessler (11), has "stressed the fact that an organic change may act as a trigger to set off regressive processes." Fessler (11), in discussing the psychopathology of climacteric depressions, also alluded to the influences of somatic factors on psychologic behavior.

Thus the phenomena which are witnessed following the administration of certain adrenocortical steroids are unique in several ways. First, these changes are incidental to the purposeful administration of potent hormones to individuals with presumably normal adrenocortical function. Second, the widespread effects which result involve more than one physiologic system; in fact, the magnitude of the dislocation may be ascribed to a direct interference with the keystone metabolic processes which underlie the organism's physiologic ability to adapt. Then too, there are derivatives of these of both a short and a long term variety which of themselves induce further mutations in the structure of the ego in an attempt to cope with what at times are drastic as well as sudden changes.

It would appear that the light which the use of these hormones can shed on the mechanics of ego psychology is their paramount contribution to clinical psychiatry. Their role in the treatment of certain psychiatric conditions can be best assayed by this effect on ego functions. While unfortunately this effect is nonspecific, in our experience it is ultimately a reversible process and thus provides another insight for the better estimation of ego defenses.

During no phase of growth and development are the adaptive integrative forces on which depends the organization of the personality subject to as great or as sudden a change as they can be incident to treatment with these hormones. Under ordinary circumstances, there is no opportunity to gauge the dynamics and the structural resources of personality organization in a physiologic context different from the usual level of biologic function. Physiologic patterns for the most part are constant. When they change, as they naturally and most obviously do at puberty, during the menstrual cycle, at pregnancy and at menopause, the rate of change is of a different order of magnitude from that brought about by even the usual therapeutic doses of these hormones. Consequently, although these phases of life are fraught with greater stress than other periods and hence afford fertile fields for the investigator, they do not lend themselves to experimental study before, during and after the change. In addition, the natural processes lack the advantage of being as readily reversed.

Freud's (12) formulation of the ego clearly suggested that the nuclear components of its function were initiated by biologic processes. Subsequent investigators (5, 13–17) of what Glover (18) called "ego nuclei", prelim-

inary to the development of a mature synthesized ego function, imply a certain constancy of the physiologic substrate in their description of the effects brought about by changes in the external environment. The induced changes in the ego which attend cortisone therapy, the hormonal treatment of Addison's disease and adrenocortical virilism, and the surgical conversion of the hypercorticism characteristic of Cushing's syndrome to the hypocorticism of the desired postoperative condition, illuminate in a complementary way many speculations heretofore adduced solely from psychologic observations.

The ego-dystonic effects of cortisone in certain patients produce signs and symptoms indicative of regression to a more psychologically immature level. These are the reaction types described as groups 3 and 4. This regression is compelled by limitations inherent in the ego development of the patient to adapt to the stress of great internal environmental change. Anxiety, guilt and hostility are mobilized by the need for defensive tactics commensurate with this more immature level of adaptation. Similar to the stress of puberty and menopause, for example, in certain vulnerable patients, there are depressive mood changes, the development of phobic and obsessional or paranoidal defenses dynamically reminiscent of old, unresolved conflicts. The tendency to defensive acting-out and an exacerbation of psychosexual conflicts develop in those patients whose character organization predisposes them to this type of reaction.

Our experience indicates that all of the patients in whom psychologic responses graded 3 and 4 have developed, have made more or less marginal psychologic adjustments prior to their treatment with these substances. As such, they are inherently vulnerable to what for them is the traumatic stimulus of sudden, great change in the constancy of the internal environment.

A second factor has to be considered in all of the patients of this series. The primary indication for the hormonal treatment is usually an underlying disease of the collagen type. Without consideration of the etiology of these diseases, about which there is much speculation, as a corollary of serious, chronic, painful and disabling symptoms, these patients have made adaptations consistent with their psychosocial economy. As a rule, this implies some degree of regression, with the net result that their level of adaptedness at the time they are initially treated is distinctly different from what might be considered a modal norm for a well population. Although their character organization determines the choice of their defenses and hence the way they accommodate themselves to their disease, the nature of the disease itself plays an important role in putting different, actual as well as symbolic, premiums on certain symptoms. Real anxiety is provoked by the reality factors with which the patient has to contend,

and the preferential mode of handling this anxiety induces the development of an additional tier of defenses. After a period of time, the very fact of living symbiotically with a disease encourages the development of a level of adaptedness which minimizes the decompensating effects of the initial stress. Paradoxically then, to be precipitated into a state of well-being, from a symptomatic standpoint, at least, is an equally stressful occasion, for it necessitates a change, with all that that implies.

In contrast to the studies on the effects of estrogenic hormones, there are but few data on the characterologic influences of androgenic hormonal elements. However, there is reason to believe that in female patients treated with cortisone over a period of time, among other metabolic variations which are produced, is an important one in the estrogen-androgen balance. This is apparent in the changes noted in the content of dreams and phantasy; psychosexual conflicts which have been asymptomatic heretofore are fulminated in many instances into clinical intensity. Aggressive bitterness often replaces normal libidinous interests, and almost invariably heterosexual preoccupation and activity wane to the point of total disappearance. At this point, it is usual to find a considerable displacement of affect to certain organs or symptoms with a commensurately heightened emotional investment in the minutiae of the patient's own physical person. It is our observation, substantiated by evidence from patients with adrenocortical virilism and Cushing's syndrome, that when the total amount of cortisone given is sufficient to produce this type of Cushing-like syndrome, equally profound changes in the goals and integrated functions of the patient's ego can be found if they are looked for.

It is generally appreciated that only under optimal circumstances is the slower defemininization process of menopause unattended by more or less gross changes in ego-syntonicity. This fact was noted by Freud (19), who pointed out the characterologic metamorphosis which accompanies the abandonment of genital function. By the same token, one sees with great frequency a comparable metamorphosis incident to the production of a Cushing-like syndrome. Descriptively, the patient, as well as others, complains of the marked petulance and irritability which seem characteristic. There are a circumscription of interests, emotional lability and a distortion of usual sleep pattern. Dreams and phantasies document the psychologic regression typified by an accentuation of infantile psychosexual conflicts. This pattern of response was seen more frequently during the early clinical experimentation with larger daily and total doses of cortisone than it is now.

In summary, these observations lead to the conclusion that in a more intimate way than is usually appreciated, the integration of the ego is dependent on the constancy of the internal environment. Hence, the ad-

ministration of certain adrenocortical steroids is psychologically traumatic to the degree that it provokes defensive reactions in response to what is interpreted as a stressful experience. The symptomatology which results, as well as the initial vulnerability to this stress, is a function of the organization of the personality of the patient.

REFERENCES

1. Rome, H. P. and Braceland, F. J.: Use of cortisone and ACTH in certain diseases: psychiatric aspects. Proc. Staff Meet., Mayo Clin., *25:* 495–497 (Aug. 16) 1950.
2. Rome, H. P. and Braceland, F. J.: The psychological response to ACTH, cortisone, hydrocortisone, and related steroid substances. Am. J. Psychiat., *108:* 641–650 (Mar.) 1952.
3. Rome, H. P. and Braceland, F. J.: The effect of ACTH, cortisone, hydrocortisone and related steroids on mood. J. Clin. & Exper. Psychopath., *12:* 184–191 (Sept.) 1951.
4. Rome, H. P. and Braceland, F. J.: Psychological response to corticotropin, cortisone, and related steroid substances: psychotic reaction types. J. A. M. A., *148:* 27–30 (Jan. 5) 1952.
5. Hartmann, Heinz: Comments on the psychoanalytic theory of the ego. In Eissler, R. S. and others: The Psychoanalytic Study of the Child, *5:* 74–96. New York, International Universities Press, Inc., 1950.
6. Hench, P. S., Kendall, E. C., Slocumb, C. H. and Polley, H. F.: Effects of cortisone acetate and pituitary ACTH on rheumatoid arthritis, rheumatic fever and certain other conditions; a study in clinical physiology. Arch. Int. Med., *85:* 545–666 (Apr.) 1950.
7. Freud, Sigmund: New Introductory Lectures on Psychoanalysis, p. 162. (Translated by W. J. H. Sprott.) New York, W. W. Norton & Company, Inc., 1933.
8. Freud, Anna: The Ego and the Mechanisms of Defence, p. 152. (Translated by Cecil Baines.) New York, International Universities Press, Inc., 1946.
9. Benedek, Therese and Rubenstein, B. B.: The correlations between ovarian activity and psychodynamic processes. I. The ovulative phase. Psychosom. Med., *1:* 245–270 (Apr.); II. The menstrual phase. Ibid, 461–485 (Oct.) 1939.
10. Benedek, Therese: Climacterium: a developmental phase. Psychoanalyt. Quart., *19:* 1–27, 1950.
11. Fessler, Laci: The psychopathology of climacteric depression. Psychoanalyt. Quart., *19:* 28–42, 1950.
12. Freud, Sigmund: The Ego and the Id, p. 31. (Translated by Joan Riviere.) London, Hogarth Press, 1947.
13. Hartmann, Heinz, Kris, Ernst and Loewenstein, R. M.: Comments on the formation of psychic structure. In Freud, Anna, Hartmann, Heinz and Kris, Ernst: The Psychoanalytic Study of the Child, *2:* 11–38. New York, International Universities Press, 1946.
14. Hoffer, Willie: Development of the body ego. In Eissler, R. S. and others: The Psychoanalytic Study of the Child, vol. 5. New York, International Universities Press, Inc., 1950.
15. Kris, Ernst: Notes on the development and on some current problems of psychoanalytic child psychology. In Eissler, R. S. and others: The Psychoanalytic Study of the Child, vol. 5. New York, International Universities Press, Inc., 1950.
16. Loewenstein, R. M.: Conflict and autonomous ego development during the phallic phase.

In EISSLER, R. S. AND OTHERS: The Psychoanalytic Study of the Child, vol. 5. New York, International Universities Press, Inc., 1950.

17. RANK, B. AND MACNAUGHTON, D.: A clinical contribution to early ego development. In EISSLER, R. S. AND OTHERS: The Psychoanalytic Study of the Child, vol. 5. New York, International Universities Press, Inc., 1950.

18. GLOVER, EDWARD: A developmental study of the obsessional neuroses. Internat. J. Psycho-Analysis, *16:* 131–144 (Apr.) 1935.

19. FREUD, SIGMUND: The predisposition to obsessional neurosis; a contribution to the problem of the option of neurosis. In JONES, ERNEST: Collected Papers, *2:* 122–132. (Translated by JOAN RIVIERE.) London, Hogarth Press, 1924.

CHAPTER XXIII

CARBON DIOXIDE INHALATION THERAPY

L. J. MEDUNA AND A. I. JACKMAN

In 1947 Meduna reported that when reinvestigating the claims of Loevenhart, Lorenz and Waters regarding the effects of different concentrations of CO_2 on psychotic patients, he was able to work out a method of treatment for psychoneurosis by gas inhalation. This method has the unique feature of a direct attack on some neurotic symptoms in spite of an intentional omission of any psychotherapy. Thus, in this method, recovery depends only on the effect of the gas upon the brain tissue of the patient.

In his first paper on the subject (1) he reported the results of this new treatment on thirty-two psychoneurotic cases. Twenty patients—that is to say 62 per cent of the cases—improved greatly, while twelve cases did not show any improvement. In this paper he used Malamud's classification of the psychoneuroses. Accordingly, there were among these patients twelve of the so-called conversion group (three cases of conversion hysteria; seven cases of spastic colitis; one case of stuttering and one case of tension). There were nine cases with obsessive-compulsive neuroses and eleven cases of personality maladjustment such as marital difficulties, frigidity, inferiority feeling, anxiety neurosis, emotional instability, and chronic alcoholism. He found that almost all the patients who created physical symptoms without underlying organic pathology or those who created pseudo-psychotic symptoms, and those with faulty control of emotional reactions with symptoms of sense of guilt or inadequacy and irritability, were suitable for this treatment.

The procedure itself has undergone some change since his original publication. At the beginning he was using a gas mixture of 20 per cent CO_2 and 80 per cent O_2. He found, however, that many patients did not respond in the expected manner to this mixture and therefore, for the past three years, he has been using a mixture of 30 per cent CO_2 and 70 per cent O_2. A reducing valve is necessary to reduce the pressure of the gas while the patient is inhaling. Flowmeters that limit the amount of gas are not suitable for this treatment. An inhaling mask is to be used which has a mechanical spring valve that closes when the patient inhales and opens when the patient exhales. A five liter inhaling rubber bag is connected directly with the mask.

The 30 per cent CO_2 produces a remarkable alteration of almost every nervous activity. It may produce simple rudimentary sensory phenomena, complicated dreams with or without emotional discharge, or emotional discharge without any dream whatsoever, complicated conditions of temporary confusion, hypnagogic hallucinations and complicated cortical and subcortical motor discharges. The sensory phenomena are mostly optical in nature, sometimes acoustical or tactile and very rarely olfactory. The optical phenomena may consist of the appearance of dazzling white or vague red lights, or small spots in the visual field. These spots or dots may grow into printed or written letters or symbols, or they may arrange themselves in geometrical patterns and quite often into elaborate figures with a straightforward or gyrating movement, or they may attain a perspective and become an actual dream. The dreams may be commonplace, every day dreams (which occasionally might be open to symbolic interpretation), in some other cases the dreams are so weird and fantastic that they may defy description and occasionally they may develop into an ecstatic condition resembling religious experiences or epileptic auras.

In 1949, Meduna and Gyarfas (2) published the clinical analysis of the motor phenomena during CO_2 treatment. These phenomena consist of indications of psychomotor excitement, flexion at the knee and hip joints, slight flexor-hypertonus in the upper extremities and very frequently carpal spasms of both hands. Very rarely, at around thirty respirations of the gas mixture, forced grasping and biting appear. If administration of the gas is continued beyond the above described phase—let us say between thirty and fifty respirations—adversive seizures occasionally appear. These seizures consist of conjugate deviation of the eyes and torsion of the body in the same direction. The movements are sometimes restricted to the lower limbs and resemble bicycling. More commonly, there is also a simultaneous alternating change in the tonus of the contralateral upper extremity and thus the whole picture imitates quadrupedal locomotion.

After forty respirations the plantar reflexes becomes less active and later, with fifty to sixty inhalations, they disappear and Babinski's sign appears. If the treatment is continued beyond that phase the pupils become rigid, the eyes are rolled upward and opisthotonus with tonic extension of all extremities and areflexia ensue. This is the typical picture of decortication.

It is easy to see that the motor phenomena, appearing in the above described order, follow the pattern of a progressive decortication: the increased restlessness, expressive psychomotor movements are well known phenomena in structural or functional impairment of the pre-frontal control. When the inactivity of the cortex extends sufficiently to eliminate the electrical activity of all structures above the mid-brain, the described decorticate fits ensue.

The tonic attacks of opisthotonus are probably produced by interruption of pathways from the cortical suppressor areas which inhibit the bulbar reticular formation.

The CO_2 treatment should not utilize the whole range as above described. As a matter of fact, we believe that the therapeutical range of the CO_2 administration should not extend beyond the point when the symptoms of an increased flexor tonus appear.

This point is easily determined by trying to bend the patient's arm. At the first sign of cog-wheel symptoms the upper limit of the therapeutically useful range usually has been reached. This point may occur anywhere from twenty to forty respirations.

The patient usually loses consciousness at between three to twelve respirations and yet there is a strange phenomenon, discovered by McRae, i.e., the therapeutical anesthesia can be given the patient while he is sitting in a chair or even standing unsupported.

The CO_2, after stimulating the respiratory center, produces a dyspneic symptom. This dyspnea is felt by many patients as a choking or smothering sensation. Most of the patients learn very easily to overcome this sensation, but in some others it produces an anxiety approaching panic that makes impossible the administration of the treatment.

Meduna recommends for these cases the combination of nitrous oxide inhalation with the CO_2 treatment. In this procedure he connects both the nitrous oxide and the CO_2 tanks by means of a "Y" tube with the inhaling mask. The timid, or too apprehensive, patient first receives thirty to sixty seconds' treatment by inhaling nitrous oxide.

This pre-treatment produces a light anesthesia during which we can proceed with the administration of the CO_2 without producing any fear in the patient. The amount of nitrous oxide administered to the patient does not alter the amount of CO_2 to be given afterwards.

Meduna, in his monograph about the subject matter (3), has reported the treatment of the first one hundred patients. Sixty-two per cent of the patients treated have greatly improved.

In his monograph Meduna has discarded the descriptive classification of neuroses and proposed a classification based on the division of the nervous system that is predominatly involved in producing the patient's neurotic condition. Thus he differentiated in his monograph:

1. Sympathetic reaction such as anxiety neurosis;
2. Parasympathetic reaction including spastic colitis, ulcer, cardiospasm, frigidity, etc.;
3. Motor reactions including stuttering, tics, muscle tensions, etc.; and finally,
4. The ideo-motor reactions including character neuroses, inferiority neurosis, homosexuality, and alcoholism.

The number of treatments these patients received showed a great variation. The minimum was fourteen treatments and the maximum was one hundred and fifty. The average patient usually needs between forty to sixty treatments to achieve full recovery. At the beginning of his studies Meduna gave the treatments six times a week in the morning hours. In ten selected cases he was able to establish the fact that several treatments daily did not shorten the time necessary for recovery.

These ten patients received from three to eight treatments daily at intervals of from one to three hours. We do not believe that the treatments should be spaced at greater intervals than forty-eight hours. We know of one case only that obtained some superficial benefit with two treatments a week and of one other case that obtained a very transient benefit of short duration from fifty treatments given once a week. In our present practice we give the treatments three times a week, every other day.

The number of patients Meduna has treated to date is three hundred and twenty, and the recovery rate remains practically unchanged since his original publication, that is, 62 per cent. Jackman has treated two hundred and four patients up to date. He achieved clinical recovery in 68 per cent of his cases and in an additional 10 per cent of the cases clinical improvement.

The first reinvestigation of Meduna's claim was published by Kindwall and his associates. They reported around 50 per cent recoveries in their group of fifty cases. Jackman and Schorr (4) reported eighty improvements in ninety cases.

Silver (5) of Duke University has reported the treatment of fifty psychoneurotic patients with 86 per cent improvement. Silver mentions the very interesting fact (which we have observed in our cases as well) that some patients, after they have obtained a degree of improvement and terminated their treatments, kept on improving for several months after the treatment was finished. Silver reported that the number of inhalations in his group varied "from twenty to forty on the average".

He reported furthermore that manic-depressive patients did not benefit from the CO_2 inhalations. The failure of this treatment in psychotic conditions has been known in this country since the original publication of Loevenhart, Lorenz and Waters.

Moriarty (6) of Los Angeles reports: "In a series of sixty-six patients, including seven nosologic groups, the overall results were: Twenty-six patients, or 39 per cent, were classified as 'much improved', twenty-eight patients, or 43 per cent, as 'improved' and ten patients, or 18 per cent, as 'unimproved'." The breaking down of Moriarty's figures makes his results even more impressive: Out of thirty-two patients with anxiety neurosis

and phobic reactions, thirteen were classified as "much improved"; seventeen as "improved" and only two who did not improve; out of eighteen cases diagnosed as character neurosis, nine patients obtained much improvement, six patients were improved and only three unimproved. Out of eight cases of psychosomatic reactions three were much improved, four improved, and only one was unimproved.

Moriarty has connected the CO_2 therapy with psychotherapy, mostly of the analytical kind. He states: "The clinical results indicate that while CO_2 therapy is beneficial by itself, the overall improvement is definitely hastened by correlated psychotherapeutic interviews. On the other hand, a significant proportion of patients whose illness had been quite resistant to psychotherapy alone responded in a gratifying way when the CO_2 treatment was added to their program."

Wilcox (7) uses the CO_2 in combination with a psychotherapy originated by him. He calls his technique "Psycho-Penetration". This method consists of asking ethically shocking questions of the patients and observing their reactions and of explaining the underlying dynamics of the patient's reactions.

McRae (8) reports the very significant contribution to this therapy that the CO_2 treatments can be given to pregnant women without any apparent danger or damage to the embryo or the new born. Unfortunately, McRae did not publish any statistics of his cases.

A. Baudouin and his associates (9) reported the application of CO_2 treatment to ten epileptic cases of grand mal and petit mal type: "Of these ten patients there were two whom the treatment did not affect and did not aggravate. The other eight patients were benefited by the treatment. In three of them we could speak of complete control. In five others the control was only partial."

The authors of this preliminary report are very cautious in summing up their results. They feel, and we believe correctly so, that the seizures of epileptic patients must be controlled by using the different anticonvulsants and if this is possible, there is, of course, no need to treat them with CO_2. With patients who do not react sufficiently to barbiturates and hydantoines, the inhalation of CO_2 might produce excellent results.

Wm. Sargant (10) reports on the CO_2 Inhalation Therapy as follows: "For the past two years, four to five treatment clinics a week have been provided for the treatment, teaching, and research into Meduna's new method of treating neuroses by inhalation of a mixture of 30 per cent CO_2 and 70 per cent O_2. Treatment is usually given three times a week to outpatients. Results are now being assessed for publication. The treatment is easy to administer, free from serious risk, and helpful in certain selected neuroses. It is, however, a selective treatment and traumatic hysterical

reactions seem to respond best. Reactive depressions and states of hysterical depersonalization may be helped. Most patients, after their response to the first few treatments has been assessed, come for treatment unaccompanied. One hundred and ninety-three patients have received this treatment during the past three years; the number of treatments varying from one to sixty-two per patient."

There is no doubt in our minds that the CO_2 treatment of psychoneurotic conditions is of the same significance as the introduction of convulsive treatment was in the treatment of psychotic conditions. Both treatments have a psychological component, but this factor alone cannot be made responsible for the recoveries achieved by them.

Meduna has always maintained that the recoveries achieved by the convulsive treatments are to be explained on the basis of the biochemical changes produced by the convulsions, so he is convinced that the recoveries of psychoneurotic patients accomplished by the CO_2 treatment have to be explained by the electro-physiological, general physiological, and biochemical changes produced by the application of the CO_2 gas to the neurotic body.

In order to do that he worded his physiological theory of psychoneuroses in the following axioms:

1. Behavior is a homeostatic action of the nervous system, an action tending to restore the previous state, or to set up a new equilibrium of that system.
2. The homeostasis, or the new equilibrium, is achieved by mobilizing reverberating circuits of different types, all of which circuits tend to achieve or maintain dynamic symmetry.
3. Homeostasis will be successful if it removes the stimulus which has set the reverberation into action or, in other words, if the output of the system is adequate to the input.
4. If the output of any reverberating system reinforces the input, mounting inner tension ensues and thus psychoneurosis results.
5. Any decrease in the threshold of stimulation of the reverberating circuits—i.e., the feed-back mechanisms—automatically prevents successful homeostasis and thus produces psychoneurosis.

In terms of the above theory the changes produced by the CO_2 upon the living nerve are applicable to a physiological explanation of the results produced by the administration of the gas. The electro-physiological changes produced by CO_2 are:

1. Carbon dioxide produces an increase in the membrane potential of the nerve, which increase in the membrane potential is accompanied by a rise of the threshold of stimulation of the nerve;
2. Carbon dioxide increases the height and prolongs the duration of the action potential;
3. Carbon dioxide produces an increase in the duration of the negative after potential;
4. Carbon dioxide decreases the fatigability of the nerve cell. Carbon dioxide increases

the ability of the nerve to conduct trains of impulses, because the presence of carbon dioxide delays the appearance of the signs of failure: increase in threshold, decrease in speed of conduction, decrease in height of the spike (11).

Besides these electro-physiological phenomena, there are the following general physiological facts to be considered:

1. Carbon dioxide produces increased oxygenation of the blood circulation in the brain due to dilation of the arteries;
2. Carbon dioxide produces abrupt changes in the pH of the blood and of the brain tissue;
3. Carbon dioxide produces changes in the endocrine glands: a hypersecretion of adrenalin is followed by a hyposecretion. A hyper- and subsequent hypophase is produced in the adrenal cortex and in the basophilic cells of the pituitary gland. The thyroid becomes more inactive (12).

Further research will determine whether any one factor or a combination of several factors is predominantly useful in Meduna's therapeutical procedure.

REFERENCES

1. Meduna, L. J.: Pharmaco-dynamic treatment of psychoneuroses. Dis. of the Nerv. Syst., *8:* no. 2, Feb., 1947.
2. Meduna, L. J. and Gyarfas, K.: Motor and sensory phenomena during therapeutical CO_2 inhalations. Dis. Nerv. Syst., *10:* no. 1, 1949.
3. Meduna, L. J.: Carbon Dioxide Therapy. A Neurophysiological Treatment of Nervous Disorders. Chas. C Thomas, Springfield, Ill., 1950.
4. Jackman, A. E. and Schorr, C. A.: An evaluation of carbon dioxide therapy of the neuroses.
5. Silver, George A.: Carbon dioxide therapy. Paper read in the Sect. of Psychiatry-Neurology of the North Carolina Med. Meeting. Psychiatric Quarterly. In Press.
6. Moriarty, J. D.: Carbon dioxide inhalation therapy of neuroses. Manuscript.
7. Wilcox, P. H.: Psychotherapy aided by Meduna's CO_2 treatment. J. Michigan M. Soc., *47:* 50–56, Jan., 1948.
8. McRae, L. D.: Carbon dioxide in obstetrics. Dis. Nerv. Syst., *12:* 4, Jan., 1951.
9. Baudoin, A., Redmond, A. and DeLarue, R.: Therapeutic effects of inhalation of 70% oxygen and 30% carbon dioxide (carbonarcosis). Bull. Acad. Nat. Med., *131:* 483–487, July 8–29, 1947.
10. Sargant, Wm.: Report of the Department of Psychological Medicine, St. Thomas' Hospital, London, 1951.
11. Lorente de Nò. A Study of Nerve Physiology. Studies from the Rockefeller Institute, 1947.
12. Schaefer, K. E.: Adaptation of men and animals during prolonged exposure to increased CO_2 concentrations. U. S. Naval Med. Research Lab. New London, Conn. Am. Journ. Phys., Vol. 163, No. 3, 1950.

CHAPTER XXIV

EVALUATION OF DRUGS IN THE TREATMENT OF ALCOHOLISM

MARY JANE SHERFEY AND OSKAR DIETHELM

Biosocial problems caused by excessive use of ethyl alcohol are manifold, dependent on the alcohol consumed as well as the type of beverage, the physiologic and psychologic condition of the drinker, and on the social factors of his special type of environment. Although the discussion which we present deals with all types of alcoholism, it is necessary to define some of the outstanding clinical groupings. Besides acute intoxication which presents a minor therapeutic problem, the physician should recognize the heavy social drinker, the excessive drinker, and the chronic alcoholic. These groupings become obvious in the analysis of alcoholic patients admitted to the Payne Whitney Psychiatric Clinic during the last 15 years.

In our definition, a chronic alcoholic is a person who consumes alcohol to such an extent that it interferes with a successful life (including physical, personality, social aspects), who is not able to recognize this damage, or is unable to control his alcohol consumption although he is aware of its disastrous results. This definition takes into consideration undesirable effects on physical and mental health, on family and group relationships, on work and other responsibilities.

An excessive drinker is an individual who uses alcohol frequently and in large quantities and may even behave psychopathologically when under the influence of alcohol. He is, however, capable of overcoming the habit when he becomes aware of the necessity to do so. A heavy social drinker drinks heavily during social occasions, with frequent or even regular intoxication, but the drinking does not present a serious handicap. The excessive and the heavy social drinkers are amenable to medical advice if they can recognize its importance. There is no special psychotherapy necessary in order to have such a patient change his mode of living if sound arguments are presented to him. If he is not able to accept or to follow the necessary advice, then, by definition, he must be considered a chronic alcoholic and be treated as such.

Treatment by drugs is indicated largely for the group which we designated by the term of chronic alcoholic. The value of such treatment lies primarily in the fact that it permits the patient to abstain from drinking

while he gains, either spontaneously or through psychotherapy, a psychologic stability which will permit him to abstain from alcohol without help. In addition, during this period of abstinence, disturbing interpersonal relationships in his family, at work, or in other problems with his environment may become adjustable. In the treatments which attempt to give this protection, tetraethylthiuramdisulphide (Antabuse), or a conditioned aversion to alcoholic beverages, is used. In another type of treatment, an attempt is made to correct underlying physiologic deficiencies which are assumed to be derived from constitutional peculiarities. These therapeutic procedures utilize ACTH and cortisone or nutritional corrections.

In order to understand fully the therapeutic effectiveness of drugs, or of the correction of nutritional deficiencies, one must consider the psychopathologic setting in which alcoholism occurs. In our study, all types of psychopathologic reactions were noted. In a considerable number of patients, alcoholism masked a schizophrenic or a depressive illness. The majority of patients suffered from a well-defined psychoneurosis or psychopathic maladjustment. About a fourth of the patients had rigid, somewhat compulsive personalities, without having a well-defined psychiatric illness. Some patients were well-adjusted individuals who drank socially, but who, after the age of forty, when life presented increasing stress, developed into chronic alcholics. The important therapeutic conclusion is that there does not seem to be a specific psychopathologic reaction or a special personality type which is etiologically significant in alcoholism. As one deals with biosocial reactions, all psychologic, physiologic, and social factors which are peculiar to an individual alcoholic, must be considered in the treatment. The efficacy of any treatment by drugs may be enhanced or impeded by some of these factors. A generalizing evaluation of therapy is therefore fallacious. Only after careful study of individual cases will it be possible to arrive at the essential indications and contraindications of treatment by drugs.

ADRENOCORTICOTROPIC HORMONE (ACTH)

ACTH is claimed a dramatically effective therapeutic agent in the treatment of delirium tremens, alcoholic hallucinosis, and Korsakoff's psychosis, as well as in acute alcoholic intoxication. In delirium tremens, Smith (11, 12, 13) considers ACTH to be the treatment of choice with no other medication necessary. He reports that, in doses of 25 mgm. q. 6 hours, improvement in all symptoms is noted in 3 to 10 hours and a complete remission of all symptoms within 24 hours. The clinical improvement is accompanied by a corresponding improvement in the circulating eosinophil levels. However, it must be stressed that the use of this drug in these conditions is still in its early experimental stages. Too few patients have been carefully

studied to allow valid conclusions concerning the therapeutic effectiveness, contraindications, complications, and long-term effects.

The rationale of its use follows the theories concerning pituitary-adrenal dysfunction in other physical stress situations. Smith proposes as a hypothesis that delirium tremens is similar, biochemically, to the Addisonian crisis and is an expression of adrenal exhaustion.

The use of ACTH to effect a permanent cure of chronic alcoholism has not justified the earlier claims. On the basis of studies showing that the chronic alcoholic has an inadequate response to test doses of epinephrine and to ACTH as measured by the eosinophil count, Smith states that chronic alcoholism may be due to a pituitary-adrenal dysfunction. Tintera and Lovell (14) assume that many alcoholics have a constitutional make-up and biochemical findings suggesting hypoadrenocorticism. These authors uses adrenocortical extract intramuscularly at maintenance doses for indefinite periods. While such treatment is of unquestionable benefit in some cases for the physical manifestations, there is no indication that a specific etiology and cure of chronic alcoholism has been found. The theories advanced do not fit all the facts.

TETRAETHYLTHIURAMDISULPHIDE (ANTABUSE)

This drug erects a chemical barrier between the alcoholic patient and alcohol; so long as it is in the body, even 1 or 2 oz. of alcohol may produce sudden death.

Although first described by Hald, Jacobsen, and Larsen (6) in Denmark in 1948, the pharmacological action of the drug is still unclear.

The earlier claims that alone it is chemically inert are not justified. During the first 3 to 4 weeks on the drug, many patients experience some drowsiness, fatigue, headaches, or gastro-intestinal disturbances. Moderate leukopenia and urticaria have been reported. Guild and Epstein (5) state that changes in the electroencephalogram may appear; and these writers believe that it does have some pharmacologic action on the central nervous system. However, these early symptoms are usually mild and disappear as the dosage continues.

When alcohol is ingested by a patient taking tetraethylthiuramdisulphide, a drastic reaction occurs within 7 to 15 minutes. The symptoms of acetaldehyde poisoning with sudden hypotension and peripheral vascular collapse appear. Electrocardiographic changes are reported during the reaction (3, 10); and the myocardial insufficiency always presents the threat of myocardial infarction.

Most workers still use the test-dose (1 oz. of alcohol on the fifth day after the drug level has been built up at the rate of 1 to 3 gm. per day) for the

psychologic effect of impressing the patient with what will happen if he drinks. The several deaths (7), numerous near-deaths, and irreversible cardiac damage resulting make it highly questionable if the test-dose is worth the danger. With careful explanation and strong suggestion, patients who have not had a test-dose seem to have just as healthy a respect for the alcohol reaction as those who have experienced it.

With these facts in mind, several authors suggest starting with a dosage of 1 gram a day, omitting the test-dose, and reducing the dosage to as little as 125 mgm. daily for maintenance dose. With this dose, intense side-effects such as lethargy, fatigue, and decrease of sexual potency are lessened.

It is now tentatively believed that the drug interferes with the complete detoxification of alcohol in the liver by blocking enzymatic activity. The oxidation of alcohol proceeds only to the acetaldehyde stage and lethal quantities of acetaldehyde rapidly accumulate. It is suggested that the use of ferrous sulfate alone or combined with ascorbic acid in the treatment of the alcohol reaction is related, in a still unknown way, to overcoming this enzymatic block (2).

It is apparent that any patient with cardiovascular disease or serious liver damage must be carefully evaluated before given the drug and should never be given a test-dose. Diabetes, epilepsy, or any other serious concomitant illness raise delicate clinical decisions where the possible danger of an alcohol accident must be weighed against the danger of continued alcoholism.

To date, the drug has been given almost indiscriminately to all types of alcoholics, and the reports indicate that 50 to 60 per cent of the cases have remained sober for a year or more. However, there are more and more reports on the number of relapses and of serious mental illnesses (3, 5). Bennett and his associate (1) reported acute, transitory, disorganizing illnesses in 7 of 37 patients. (Laux (8) presents detailed case material, which seems rather convincing, that toxic psychosis may occur in the presence of the drug without the addition of alcohol. His cases do not suggest an underlying schizophrenic illness.) From our own studies and from cases reported in literature, it is, however, not clear whether disorganized states are due to the toxic effects of the drug itself, to the appearance of underlying disorganizing trends previously masked by the alcohol, or both.

There are no clear-cut psychiatric contraindications for this therapy that apply in all cases. Generally, the more unstable and poorly organized the patient, and the greater the tendency to live out emotions during sobriety and intoxication, the less can be expected from any form of treatment. Such patients usually "go off" the drug in a short time and resume drinking. It should be stressed that to some patients the need for alcohol to relieve intolerable emotional upsurges is so great that the mere knowledge that alcohol will be irrevocably denied them is sufficient to prevent them from

taking the drug in the first place. Patients who refuse it or who do not stay on it are special problems frequently requiring long-term hospitalization with intensive psychotherapy and rehabilitation.

Tetraethylthiuramdisulphide is merely an adjunct to therapy; intensive or supportive individual or group psychotherapy should always be given. Properly used, it promises to be a very effective adjunct to psychotherapy which, heretofore, has been so often blocked by the alcoholic's inability to endure anxiety, resentment, and tension without drinking. The presence of this drug and its dreaded consequences (if alcohol were taken) force the patient to tolerate these emotions.

CONDITIONED AVERSION THERAPY

The proposal of Lemere, Voegtlin et al. (9) to control the impulse to consume alcohol by a conditioned aversion to it has attracted considerable attention. A brief formulation is given to the patient, and he receives a hypodermic administration of emetine hydrochloride to produce nausea and vomiting. Pilocarpin hydrochloride is added to produce unpleasant sweating, and ephedrine sulfate for cardiac support. If a patient is very anxious some pentothal may be given an hour before the administration of the emetine. (Emetine is considered superior to apomorphine because it does not have a sedative effect.) After the injection, the patient is offered in succession a variety of strong drinks, including whiskey, gin, and beer. The patient is urged to continue drinking despite vomiting. He is requested to smell the drink as well as keep it in his mouth to be aware of the taste. The whole procedure lasts about 20 minutes and is repeated on successive days. Best results are obtained if only those patients who are eager for help are selected. The treatment is less drastic and less unpleasant than it may appear. Patients are, therefore, usually willing to return for one or two therapeutic procedures if they or their physician begin to doubt their ability to abstain, or if a relapse into drinking has occurred. It is obvious that patients with certain physical illnesses (peptic ulcer, coronary and myocardial disease, active tuberculosis, hernia) or severe psychopathological maladjustments, should be excluded. To what extent we deal with a fear of the consequences of drinking or a true aversion is unclear. Suggestive factors are no doubt important. This procedure presents an interesting attempt at creating a reaction of aversion to alcoholic beverages which does exist in many former alcoholics, giving them a sense of security. The therapeutic results obtained make it worthwhile to investigate whether by improvement of this method, or by quite different psychologic or pharmacologic procedures, a lasting aversion can be obtained, and in what type of individual.

NUTRITIONAL THERAPY

An approach to correcting nutritional defects which are assumed to be of etiologic significance is proposed by the biochemist, Roger Williams (15). He started his investigation with the goal to determine the biochemical variations in a so-called normal man. In his studies of rats and human subjects he found that distinctive metabolic patterns give the total picture of metabolism of an individual "including the chemical process in each and every organ and tissue and their effects on each other". The metabolic pattern does not correspond to the total metabolism, measured in calories. He determined the relative concentrations of numerous substances (amino acids, vitamins and other compounds) in samples of urine and saliva, using the paper chromatogram method. In addition, he studied taste thresholds.[1] There are day-to-day varations in saliva and urine, and in taste threshold, but a distinctive pattern which remains nearly constant, is characteristic for each individual, and is not essentially influenced by dietary changes. Williams assumes that one deals with hereditary differences. Based on these studies he postulates that individuals with a strong tendency to become alcoholic possess distinctive, but as yet not determined, metabolic features. If this were so, appetite for alcohol might arise as a result of deficiency of certain materials in the body; a deficiency which seems to be related to the B vitamins.

These studies may be of fundamental importance, and may lead to a new therapeutic approach. At present, a mere administration of dietary supplements, as has been done by some clinicians, is not justified. Intensive clinical investigations, under controlled conditions of intake and output, are indicated. One must also clarify the role of emotions in relation to such an assumed metabolic pattern and its related appetites.

RELATIONSHIP OF EMOTIONS AND BIOCHEMICAL CHANGES

Our own studies (4)[2] into the etiology of alcoholism have not progressed far enough to permit therapeutic conclusions. The determination of the pressure and effect of specific emotions by a biological assay method has demonstrated in our alcoholic patients the importance of suppressed resentment, and to a lesser degree, of anxiety or tension, and its alleviation

[1] *Taste sensitivity:* 1, creatinine; 2 sucrose; 3, KCl; 4, NaCl; 5, HCl.
Salivary constituents: 6, uric acid; 7, glucose; 8, leucine; 9, valine; 10, citruline; 11, alanine; 12, lysine; 13, taurine; 14, glycine; 15, derine; 16, glutamic acid; 17, aspartic acid.
Urinary constituents: 18, citrate; 19, base rf. 28; 20, acid rf. 32; 21, gonadotropin; 22, pH; 23, pigment/creatine; 24, chloride/creatinine; 25, hippuric acid/creatinine; 26, creatinine; 27, taurine; 28, glycine; 29, serine; 30, citruline; 31, alanine.

[2] Supported by a grant from the Committee on Problems of Alcohol, National Research Council.

by the consumption of alcohol. The method uses a piece of duodenum of the rabbit in Tyrode solution. In the presence of anxiety the spontaneous contractions change in a way which corresponds to the reaction in the presence of epinephrine, and in the presence of tension, to a reaction of a cholinergic type. In the presence of resentment a characteristic reaction occurs on the atropinized strip only. These three different types of reactions are well defined and their degree corresponds to the intensity of the emotions.

The patients in this study reside in the Payne Whitney Psychiatric Clinic but attend to their work outside the hospital from 9 a.m. to 5 p.m. On return, their urine is tested daily for alcohol. In such patients, suppressed emotions can be detected by regular psychologic and biochemical studies. When disturbing emotions increased steadily during a period of weeks, some of these patients drank while away from the hospital and the biochemical and psychologic findings which indicated emotional disturbance disappeared promptly. Alcoholic patients who participated in this research program were given 4 ounces of whiskey while studied in the laboratory. The disturbing emotions and the corresponding biochemical findings in the blood disappeared within 30 minutes after the consumption of whiskey. The outstanding emotion was resentment and, to a lesser extent, anxiety or tension. In some patients similar results were obtained by other drugs, for example, with dibenamine in anxiety and with barbiturates in tension. In a patient, in whom anxiety was a precipitating factor in drinking and in whom the anxiety was alleviated by alcohol, the same result was obtained by dibenamine. This patient, having left the hospital, abstained completely from alcohol during 12 months while on dibenamine. During this period, however, the patient received considerable psychotherapeutic support. When dibenamine was stopped three years ago, the patient made a fair social adjustment but resorted every few weeks to alcohol when certain social situations produced anxiety. In patients in whom tension seems to play a significant role, this emotion and the corresponding cholinergic substances in the blood disappeared with administration of barbiturates. Neither dibenamine nor barbiturates seem to affect resentment and the corresponding biochemical findings.

From these studies some interesting leads have evolved which need to be pursued much farther. There is a possibility that in the distant future, some therapeutic applications may result.

In conclusion, it might be stated that the use of drugs in the treatment of alcoholism can be considered a valuable adjunct to psychotherapy and therapeutic manipulation of social factors. The hope that further progress can be achieved along pharmacologic and possibly nutritional lines seems justified. Whether this will lead to treatment which will deal with essential etiologic factors is highly doubtful.

BIBLIOGRAPHY

1. Bennett, A. E., McKeever, L. G. and Turk, R. E.: Psychotic reactions during tetraethylthiuramdisulfide (Antabuse) therapy. J. A. M. A., *145:* 483–484, 1951.
2. Child, G. P.: The failure of tetraethylthiuramdisulfide (Antabuse) to sensitize dogs to ethyl alcohol. J. Pharmacol., *101:* 6, 1951.
3. Epstein, N. B., Guild, J. and Davidoff, E.: Further clinical experience with tetraethylthiuram disulfide in the treatment of alcoholism. Quart. J. Stud. Alc., *12:* 366–380, 1951.
4. Fleetwood, M. F. and Diethelm, O.: Emotions and biochemical findings in alcoholism. Am. J. Psychiat., *108:* 433–437, 1951.
5. Guild, J. and Epstein, N. B.: Psychosis during the treatment of alcoholism with tetraethylthiuram disulfide. Quart. J. Stud. Alc., *12:* 360–365, 1951.
6. Hald, J., Jacobsen, E. and Larsen, V.: The sensitizing effect of tetraethylthiuramdisulfide (Antabuse) to ethyl alcohol. Acta. Pharm. Kbh., *4:* 285–296, 1948.
7. Jones, R. O.: Death following the ingestion of alcohol in an Antabuse treated patient. Canad. Med. Ass. J., *60:* 609–612, 1949.
8. Laux, W.: Psychosen bei Behandlung mit Antabus. Der Nervenarzt., *22:* 391–392, 1951.
9. Lemere, F., Voegtlin, W. L., Broz, W. R., O'Halloran, P. and Tupper, W. E.: Conditioned reflex treatment of chronic alcoholism. VII. Technique. Dis. Nerv. System, *3:* 243–247, 1942. Review in Quart. J. Stud. Alc., *3:* 322–323, 1942–43. (The review contains a detailed description of the technique.)
10. Macklin, E. A., Sokolow, M., Simon, A. and Schottstaedt, W.: Cardiovascular complications of tetraethylthiuramdisulfide (Antabuse) treatment of alcoholism. J. A. M. A., *146:* 1377–1382, 1951.
11. Smith, J. J.: A medical approach to problem drinking. Quart. J. Stud. Alc., *10:* 251–257, 1949.
12. Smith, J. J.: The treatment of acute alcoholic states with ACTH and adrenocortical hormones. Quart. J. Stud. Alc., *11:* 190–198, 1950.
13. Smith, J. J.: The endocrine basis and hormonal therapy of alcoholism. N. Y. State J. Med., *50:* 1704–1706, 1950.
14. Tintera, J. W. and Lovell, H. W.: Endocrine treatment of alcoholism. Geriat., *4:* 274–280, 1949.
15. Williams, R. J.: Individual metabolic patterns and human disease: An exploratory study utilizing predominantly paper chromatographic methods. Biochemical Institute Studies, *4:* no. 5109, 7–21 (The University of Texas Publication) 1951.

CHAPTER XXV

ANTI-EPILEPTIC DRUGS IN THE TREATMENT OF BEHAVIOR DISORDERS

H. HOUSTON MERRITT

INTRODUCTION

Before considering the question of the value of anti-convulsive drugs in the treatment of behavior disorders, it is necessary to go back and trace the rationale, however tenuous, behind this mode of therapy.

Early in the course of the development of electroencephalography, it was noted that children with behavior disorders had abnormal electroencephalograms. These abnormalities, while not characteristic of convulsive disorders, had certain similarities to those obtained from patients with convulsive seizures.

Jasper, Solomon and Bradley in 1938 (9) studied 71 children with various behavior disorders and found the electroencephalogram to be abnormal in approximately 50 per cent of the entire group. On the basis of the electroencephalographic findings and the clinical symptomatology of erratic, impulsive and paroxysmal outbursts of abnormal behavior, they segregated a group of 28 cases from the 71 and characterized their behavior disorder as epileptoid. It should be noted that none of these patients ever had any frank convulsive seizures.

The work of Jasper, Solomon and Bradley was soon supported by the results of studies by several investigators. Strauss, Rahm and Barrera in 1940 (15) found that 68 per cent of 44 children with behavior disorders had abnormal electroencephalograms. Thirty-five of these children had personalities which were described as "epileptoid" and the electroencephalogram was abnormal in 25 of the 35.

Gottlieb, Knott and Ashby in 1945 (8) reported 49 per cent abnormal encephalograms in 67 children with behavior disorders but without any evidence of organic brain disease.

Kennard and Willner in 1947 (10) studied 202 children with behavior disorders. Sixty-five per cent of the entire group had abnormal electroencephalograms in the nature of a general dysrhythmia and spontaneous bursts of slow high-voltage waves. Only 16 per cent of 102 normal children had abnormal electroencephalographic tracings. Eighty-six per cent of 43

children with epilepsy had an abnormal EEG. The tracings in these children differed from those of the primary behavior disorder group by the presence of spike potentials and the variability of record from day to day. In the behavior disorder group, the degree of abnormality in the EEG was related to the severity of the clinical disorder, the age at onset and the incidence of psychoses, neuroses or behavior disorders in parents or siblings. These authors suggested that distortion of the EEG in children with behavior disorders is related to early onset of anxiety or tension states.

Some doubt, however, was soon cast on the specificity of the relationship of the abnormalities in the electroencephalogram to behavior disorders by several investigators. Michaels and Secunda in 1944 (13) performed electroencephalograms in 122 children with behavior disorders, 38 of which also had enuresis. They concluded that when the behavior disorder was associated with enuresis, there was a high incidence of abnormal electroencephalograms, but that the findings in the EEG had no relationship to the "vague and complex syndrome of behavior disorder".

Solomon, Brown and Deutscher in 1944 (16) studied 40 junior high school students and 20 children in institutions for correction. They found abnormal EEG in 55 per cent of 20 best behaved high school students and in 60 per cent of the worst behaved students. Abnormal electroencephalograms were found in 65 per cent of the 20 children in an institution for correction. They concluded that the finding of an abnormal EEG may be indicative of a physiological disturbance which may influence behavior adversely, but that the same abnormal EEG findings may be present in normal children.

ANTI-CONVULSIVE DRUGS IN THE TREATMENT OF BEHAVIOR DISORDERS

With this background we turn to a study of the results obtained with the use of anti-convulsive drugs in the treatment of behavior disorders. It should be noted that in many of the reports the drugs were not the only form of therapy. Changes in environment and psychotherapy were used in some cases. It is fair to say that most of the studies were inadequately controlled.

Bradley in 1950 (5) summarized his 12 years' experience with the use of sympathocomimetic drugs, benzedrine and dexedrine, in the treatment of behavior disorders. While these drugs are not usually classed as anti-epileptic compounds, they have been used as the main or as an adjuvant therapy in patients with convulsive disorders, particularly those with seizures of the petit mal type. Bradley gave benzedrine in dose of 20 mg. per day to 275 children, dexedrine in dose of 10 mg. to 113 and both dexedrine and benzedrine to 82 children. He reported that 50 to 60 per cent of the children became more subdued. There was no change in 15 to 25 per cent and in 20 per

cent there was increased activity. There was no evidence that any of the children developed a tolerance or an addiction to these drugs. He concluded that they influenced behavior by altering the emotional reaction to distressing situations.

Other studies with benzedrine include that of Cutts and Jasper (7). These authors administered benzedrine to 12 children with behavior disorders and abnormal EEG. In about one-half of these patients there was a marked improvement in behavior. Changes in the electroencephalogram were not observed to correlate with the clinical changes produced by these drugs. They also stated that phenobarbital is definitely contraindicated in the treatment of these children.

Lindsey and Henry (11) treated 13 children with benzedrine, dilantin sodium and phenobarbital. After a control period of six weeks these drugs were administered singly to the 13 patients. All 13 showed considerable improvement with benzedrine and the same degree of improvement was obtained in 12 of the 13 cases with dilantin sodium. Phenobarbital when given in the period following the use of benzedrine was accompanied by an exacerbation of symptoms, but to a lesser degree than that which was present in the control period. EEG improvement was inconsistent and not directly related to clinical improvement.

Walker and Kirkpatrick (19) treated 10 children with behavior disorders and abnormal EEG with dilantin sodium. They reported improvement in the behavior in all 10 cases.

Bogen Tietz (17) reported that improvement in behavior may be obtained by the administration of hydantoins, benzedrine, phenobarbital or belladonna.

EFFECT OF ANTI-CONVULSIVE DRUGS ON BEHAVIOR DISORDERS IN PATIENTS WITH EPILEPSY

Our experience with children with behavior disorders has been limited mainly to those who are also subject to convulsive attacks. Improvement in the mental status of these patients may occur coincidental with the administration of phenobarbital, dilantin sodium and other anti-convulsive drugs. This is particularly true of children who have been subject to numerous attacks daily. When the anti-convulsive drugs are effective in controlling the attacks, the children appear brighter and are able to learn more quickly. They may also be more amenable to discipline and better behaved in general. This improvement in behavior could be attributed to a specific effect of the therapy on behavior or to the ability of the child to function more normally because of the cessation of the seizures. It seems to us that the latter is more the likely explanation, because behavior disorders

often persist in these children although the seizures are controlled. These children may be helped by individual or group psychotherapy. The best results are obtained when psychotherapy is also given to the parents.

Inprovements in the behavior of children or adults with behavior disorders and convulsive disorders have been reported by several investigators. Bradley in 1951 (6) states that children with epilepsy may have behavior disorders of two types. The first type of behavior disorder is classified as primary and is considered to be the direct result of neurophysiological disturbances that can be recorded by the EEG and is presumably related to the seizures. These cases are best treated by anti-convulsive drugs plus benzedrine. In the second type of behavior disorder the symptoms are related to the fact that the patient is ill and to the way he is treated by those about him. These cases are best treated by psychotherapy. Improvement in behavior in epileptic children coincidental with the administration of dilantin sodium has been reported by Putnam and Merritt (14). Zimmerman and Putnam (20) reported improvement in the behavior of children with epilepsy with the administration of glutamic acid.

Conversely, it has been noted that abnormal behavior may develop anew in patients with convulsive disorders coincidental with the administration of anti-convulsive drugs. This has been noted occasionally with the use of phenobarbital and the hydantoins. The frequency of untoward psychic effects is higher with the use of bromides and they were quite frequent with a new compound, phenurone. Tyler and King (18) summarized the results reported by various observers who have used this compound. In 350 patients the records gave information regarding the presence or absence of previous personality disorders. In 83 patients there was some evidence of a previous personality disorder. In 32 (39 per cent) there was a definite improvement in the behavior, in 33 (27 per cent) there were adverse effects on the behavior disorder and in 28 (34 per cent) there was no change. Depression, paranoia, violence, irritability and suicidal tendencies developed in 19 (5 per cent) of the 350 patients.

DISCUSSION

From a review of the literature, it is apparent that the basis for the use of anti-convulsant drugs in the treatment of behavior disorders is at least somewhat insecure. Although abnormal EEG tracings are present in a high percentage of the children with behavior disorders such abnormalities are found in the EEG of children without any abnormality of behavior. Improvement in behavior which occurred coincidental with the administration of anti-convulsant drugs is not accompanied by an improvement in the EEG. The favorable results which have been reported by most observers

have not for the most part been adequately controlled for the effect of other factors.

There is no doubt that improvement in the behavior of patients with convulsive disorders may occur after the administration of anti-convulsive drugs. It is difficult to assess the role of the medication in this improvement. In most of the cases improvement occurs only when there is complete control or a great reduction in the frequency of the seizures. Some of the improvement may be attributed to the physiological effect of the drug on the abnormal cortical activity, but other factors play a very significant if not a more important role. Among these other factors are the changes in the interpersonal relationships, particularly with the parents, which occur as the result of freedom from seizures and the ability of the child to assume a more normal role in society.

CONCLUSIONS

Anti-convulsive drugs can modify the activity of the cerebral cortex. In some patients the administration of anti-convulsive drugs is accompanied by an improvement in behavior but the evidence is not sufficient to show that this improvement is due to a specific action of the drug. This is especially true of children with behavior disorders, without convulsive seizures.

REFERENCES

1. Bakwin, H.: Benzedrine in behavior disorders of children. J. Pediat., *32:* 215, 1948.
2. Bradley, C.: The behavior of children receiving benzedrine. Am. J. Psychiat., *94:* 577, 1937.
3. Bradley, C. and Bowen, M.: Amphetamine (benzedrine) therapy of children's behavior disorders. Am. J. Orthopsychiat., *11:* 92, 1941.
4. Bradley, C.: Problem children: Electroencephalographic diagnosis and pharmacologic treatment. Conn. Med. J., *6:* 773, 1942.
5. Bradley, C.: Benzedrine and dexedrine in the treatment of children's behavior disorders. Pediatrics, *5:* 24, 1950.
6. Bradley, C.: Behavior disturbances in epileptic children. J. A. M. A., *146:* 436, 1951.
7. Cutts, K. K. and Jasper, H. H.: Effect of benzedrine sulfate and phenobarbital on behavior problem children with abnormal electroencephalograms. Arch. Neurol. & Psychiat., *41:* 1138, 1939.
8. Gottlieb, J. S., Knott, J. R. and Ashby, M. C.: Electroencephalographic evaluation of primary behavior disorders in children. Arch. Neurol. & Psychiat., *53:* 138, 1945.
9. Jasper, H. H., Solomon, P. and Bradley, C.: Electroencephalographic analyses of behavior problem children. Am. J. Psychiat., *95:* 641, 1938-39.
10. Kennard, M. A. and Willner, M. D.: Significance of paroxysmal patterns in electroencephalograms of children without clinical epilepsy. Res. Publ. Ass. Nerv. Ment. Dis., *26:* 308, 1947.
11. Lindsey, D. B. and Henry, C. E.: The effect of drugs on behavior and the electroencephalograms of children with behavior disorders. Psychosom. Med., *4:* 140, 1942.

12. Livingston, S. and Kajdi, L.: The use of phenurone in the treatment of epilepsy. J. Pediat., *36:* 159, 1950.

13. Michaels, J. J. and Secunda, L.: The relationship of neurotic traits to the electroencephalogram in children with behavior disorders. Am. J. Psychiat., *101:* 407, 1944–45.

14. Putnam, T. J. and Merritt, H. H.: Dulness as an epileptic equivalent. Arch. Neurol. & Psychiat., *45:* 797, 1941.

15. Strauss, H., Rahm, W. E. and Barrera, S. E.: Studies on a group of children with psychiatric disorders. I. Electroencephalographic studies. Psychosom. Med., *2:* 34, 1940.

16. Solomon, C. I., Brown, W. T. and Deutscher, M.: Electroencephalography in behaviour problem children. Am. J. Psychiat., *101:* 51, 1944–45.

17. Tietz, E. B.: The use of medicine in the behavior disorders. Med. Woman's J., *53*(8): 17, 1946.

18. Tyler, M. W. and King, E. Q.: Phenacemide in treatment of epilepsy. J. A. M. A., *147:* 17, 1951.

19. Walker, C. F. and Kirkpatrick, B. B.: Dilantin treatment for behavior problem children with abnormal electroencephalograms. Am. J. Psychiat., *103:* 484, 1946–47.

20. Zimmerman, F. T., Burgemeister, B. B. and Putnam, T. J.: Effect of glutamic acid on mental functioning in children and in adolescents. Arch. Neurol. & Psychiat., *56:* 489, 1946.

SUMMARY OF PAPERS XXII TO XXV

D. EWEN CAMERON, *Montreal, Canada*

First of all, with regard to the paper by Drs. Rome and Braceland, I have to confess that this is a paper that has left me feeling unsatisfied. I am not sure whether I am unsatisfied with myself or the paper, but I will try to make a differentiation as I go along.

The first thing is that I find it rather difficult to follow insofar as many of the findings with which it deals have been reported in earlier papers, and hence we have to deal here primarily with some of the conceptions that have have been derived from these data.

The paper is primarily concerned, then, with what has been termed the dynamic aspects of psychological changes which have been noted as being produced by the agents recorded. Certain categories are outlined in the paper for our guidance. These categories, I gather from discussion with Dr. Braceland, have to do not only with the behavior of patients before the drugs were given but the behavior of patients after the drugs were given. And one of the things that come out of the paper is simply this: that patients who were unstable before they had these drugs were more apt to break down under the stress imposed by these drugs than were people who were stable beforehand.

This matter of applying stress on an experimental basis to individuals at this particular level, the endocrinological or a biochemical level, is something that has been tried on many previous occasions. For instance, in connection with thyroid, Dr. Louis Cohen published quite a number of studies on this some ten years ago. Sex hormones have been applied, and also mecholyl, as reported by Dr. Eric Lindemann. And Selye, of course, has supplied us with a very good theoretical framework in which to see this matter of general and specific stress and the adaptation of the individual. It is true that Selye's work has not been mainly concerned with behavior levels, but the conception can be easily expanded to cover human activity.

There is also a statement here to the effect that what the authors are concerned with is a description of the ego structure, and once again I had a feeling of dissatisfaction and tried to avoid feeling guilty about it. But I did not get a clear enough idea of what Drs. Rome and Braceland had in their minds when they were talking about ego structure. And I think perhaps since there is some difference in point of view among those people who habitually use this conception and still more among those who don't feel

that the conception is particularly valuable, that we would be rather helped, and perhaps still can be, by a fuller statement about what is meant by the ego structure in this particular paper.

Then there is another interesting statement here which I think should be defined, and that is that the psychological responses are determined in largest measure by what has been termed the mutability of the ego. The word "mutability" sort of sticks me, because I am not sure what is intended. Is this a word derived from the term "mutation", which is used in genetics? If so, one is talking about an irreversible process. Yet later on in the paper one finds that the changes are reversible. That is an advantage, because it allows you to study the thing both coming and going.

Now, we ourselves have done a certain amount of work with ACTH and cortisone and one or two other related steroids. We have been rather disappointed in the amount of change that we have seen. It may be that we have not used enough. We have had the advantage of some of the clinical errors of our colleagues who gave too much and hence we have sometimes seen the breakdowns in patients. But our colleagues, I am sorry to say, are now growing more adept, and we don't get the breakdowns transferred to us from the Department of Medicine.

In summary, I think it is reasonable to say that this is and has been a tempting form of experimental approach—this idea of applying stress at this level—but it really has not paid off as yet in dividends. I am sure it may sometimes do that. But the reason, I would think, that it has not paid off thus far is, substantially, that it is extremely hard for us to record the kind of changes which are more subtle than relatively gross things, things that can be picked up by direct observation or even by psychological tests. I think one must point out also that many of the changes in which we might be very much interested are, no doubt, being absorbed by the homeostatic mechanisms, or the defense mechanisms, whichever terminology you prefer.

Passing on to Dr. Meduna and Dr. Jackman's paper, they are essentially reporting modifications in the CO_2 inhalation therapy produced by the former worker and applied to psychoneurotic patients. The main change, as I would gather it, consists in the raising of percentage of CO_2 from 20 to 30 per cent. It is getting rather near the per cent that Loevenhart and Lorenz used to use, as some of you may remember, in connection with catatonic patients.

In discussing the behavior of patients under this stimulation, the authors point to a great range of happenings, including abreactive phenomena, which very reasonably they mention, and they say that you can't actually separate the direct action of this gas from the psychotherapeutic action. I think it is a very proper thing to point out. They did not point out, however, that there is also a meaning to the patient, which must be taken into con-

sideration. I am sure all of you have seen mildly depressed patients who, a few days after coming to the hospital, have said that they felt so much better after the electrical treatment they had, and on inquiry you discovered that they had had an electroencephalogram taken.

There is in this detailed exposition of symptoms which appear, of changes at the symbolic level and the physiologic and neurological levels, a good similarity, as you will notice, to changes which also appear under nitrous oxide, under ether, under insulin, and under nitrogen.

In the paper there are very useful and very precise directions given to those who wish to explore this new therapeutic weapon. I should like to point out, however, an interesting thing (my neighbors at the table were quick to indicate to me, too): that the recovery rate is not substantially different from what the recovery rate has always been, as far as we know, whenever we apply some therapeutic weapons to the psychoneurotic patient. It is an odd sort of thing and an irritating sort of thing that it nearly always comes out about 60 to 70 per cent.

I hope we can break this barrier sometime, but this does not seem to have done it so far.

I do think, however, that we ought to ask if there has been a saving in time. Has this magical percentage been reached in a shorter time and at less expense to the patient and with less revenue to the hospital?

I think in asking about that we should bear in mind that we should not make comparisons with these extraordinarily long-drawn-out therapeutic procedures which take several years, but rather with the fact that from a great many of our psychopathic hospitals and the like, psychoneurotic patients are discharged at the end of six or eight weeks at least well enough to go on living at home and doing a job, and also going back to their original jobs. They are not perfectly well, but they are well enough to get on on the outside.

So I should like to ask if these results are gained much under six or eight weeks.

I think that while those of us who listened to this very interesting paper were happy to hear about the procedures, some of us will be rather less happy about Dr. Meduna's attempt to classify psychoneurotic conditions on the basis of the presumably involved sections of the nervous system. It would seem to me that again he has run into the old business of overlap; that it is hard to separate tension states, surely, from anxiety states, and I don't think that one should omit the unfortunate obsessive patients.

Then going on to Dr. Diethelm and Dr. Sherfey's paper, this is largely concerned, as you have heard, with the drug treatment of chronic alcoholism. They properly point out, however, that the main value of drugs is that they may succeed in obtaining a period for the alcoholic free from drinking,

so that he can reorganize himself with the assistance of his friends and family, or sometimes with the assistance of the therapist.

The matter of ACTH they have dealt with on a somewhat limited basis, chiefly by saying that it is reported as of some value in delirium tremens. I think that is probably being substantiated in growing degree. I don't think there is any evidence yet of its being of much value in Korsakoff's.

In regard to Antabuse, the authors point out very correctly that it is not a chemically inert substance, as it was first declared to be. There are feelings of drowsiness. There are some men—the authors did not mention this—who say they are not quite so sexually active as they were and drowsiness does not account for all of it. But these things can be overcome quite readily by giving dexedrine and things of that nature.

The authors refer also to the dangers of administration, and they point very gloomily to the rising toll of deaths and things of that kind.

I should like to offset this a trifle by saying this: north of the border we had a sort of running start on this thing, because, as you know, it was not approved down here for some time. So we have had perhaps a year or two more experience. As we have gained more experience, we have become less anxious-minded about it. Deaths do not occur. The great fear that blood pressure was going to drop out of sight does not occur so often, and in general people seem to take it much more in their stride than they did.

Also, I think it is only reasonable to say this: that while there may be an increasing number of unpleasant things reported in the literature, there are also a far greater number of cases being reported. And if you look at the centers that have had a large amount of experience, you will find that they are reporting fewer and fewer hazards as they gain more and more skill. The appearance of a greater and rising number of hazards is simply a factor of the increasing number of centers that are now coming in to make use of the drug.

I think that we may say that the percentages that they mention are very reasonable percentages for the use of the drug. The authors don't mention what seems to me to be the primary problem in the use of this preparation, and that is how to get the patient to go on taking it. That is really the fundamental thing. If you could get him to go on taking it, you would have a wonderful set of results, but you cannot get him to go on taking it save in the percentages that Dr. Diethelm and Dr. Sherfey have mentioned.

They also mention aversion treatment. This carried much of the burden and heat of the day for quite a while until Antabuse turned up. I think it is now very much threatened by Antabuse, and it would seem reasonable to say that unless the aversion proponents can find a new field in the sense of developing, shall we say, sensitivity, perhaps in the form of a gastritis, to alcohol, they are likely to be pushed out of the field by Antabuse.

The nutritional approach has been summarized for you. I won't comment on it, because it was very briefly and lucidly summarized. It might be put simply in a few words: that it has not been proven but is interesting.

The matter of a duodenal strip I have read over rather carefully, and this matter of resentment sort of catches my mind, because I feel sure, although I have not talked to Dr. Diethelm, that what he means is that if there is resentment in the individual then some of his blood added to the strip results in some special changes. But he does not say so and leaves one with the impression that it is resentment in a rabbit. I cannot help wondering how he provokes resentment in a rabbit.

The last paper is the report of Dr. Merritt. The digest will be very brief and perhaps the clearest of all, because I had only ten minutes to summarize it some fifteen minutes ago when Dr. Merritt came along to see me about it.

He has pointed out that electroencephalographic changes are found in some children with abnormal behavior, but that these children are not necessarily suffering from epilepsy. Changes in tracings in the children who have frank epilepsy differ from the above kind of changes. Earlier suggestions which were made that these nonspecific changes were the precursors of psychoneuroses have not been substantiated, and nonspecific changes have also been found in normal children. The early use of such drugs as benzedrine and dexedrine was not well controlled, and it was found that after their use, favorable changes in children, which, interestingly enough, were described as subduing them, were not consistent, and also there was no consistent relationship where the changes in the electroencephalogram in children were also accompanied by convulsions. Where these latter were controlled, there was definite improvement in behavior.

But this treatment, as Dr. Houston Merritt very wisely points out, by anticonvulsants cannot be separated from concomitant psychotherapy, and he even was so wise as to indicate that psychotherapy extended also to the parents, and when it did, the results in these children were that much the better. He finalizes the statement by saying as yet no specific action of anticpileptic drugs on behavior has been substantiated.

DISCUSSION

Dr. Paul H. Hoch [New York, N. Y.]: I should like to ask Dr. Braceland if he found in the ego organization of the patients prior to being given ACTH, any hints that they would develop psychotic reactions and what type of psychotic reactions.

I should like to ask Dr. Jackman if he did any control experiments with other gases which render the patients unconscious which would produce very similar effects to those of CO_2 and whether he thinks that the CO_2 has a specific action.

Dr. Lothar B. Kalinowsky [New York, N. Y.]: I only want to ask Drs. Meduna and Jackman what they mean by convulsive reactions in the carbon dioxide treatment. Various

hyperkinetic manifestations can be observed in this treatment, but I have never seen a generalized convulsion, although in my own work with the method I tried to elicit even longer and deeper reactions than they do. However, I may mention that in spite of these deeper levels, I did not see results from carbon dioxide treatment which would go beyond what can be achieved with a great number of other impressive treatment techniques in psychoneurotics.

Dr. John Romano [Rochester, N. Y.]: May I ask Dr. Braceland something of the nature and incidence of the psychotic reactions in patients with collagen system disease to whom a steroid substance has been given, and also whether he has had the experience of giving such steroid substance to schizophrenic patients and chronic alcoholic patients other than when the latter group is experiencing delirium tremens?

Dr. Francis J. Braceland: I hereby absolve the President-elect of the American Psychiatric Association from any guilt, which he has about discussing my paper. He states he feels a little guilty because the paper was obviously dependent upon others which had gone before. This is true. This is the fourth in a series of papers on the psychological and physiological reaction of cortisone. He is bothered about the word "mutations" but should not be. It comes from the verb "mutare" and it means "to change" and what we were driving at was that the changes which are made by the use of cortisone are reversible. They are reversible reactions.

It is true that we had described the four groups, which we touched upon lightly, in another paper and we were presuming, I suppose, that these were understood. Hence, I skipped over them lightly rather than delineating them very carefully. The first two groups concerned the mild changes in mood experienced by patients after they had been given cortisone. The third was a little more drastic and the fourth was the psychotic group. Since there has been a change in the methods of administering cortisone and the dosage, we have seen fewer of the psychotics.

It must be remembered that in these cases we were not dealing with people whom we put under stress. We were observing people who were under the stress of chronic disease and that this work was done with patients who were suffering from arthritis and rheumatic fever and who were being treated with the various members of the delta-4 pregnene series of substances. These observations that we reported were the psychiatric observations upon patients who were being treated by the internists and the rheumatologists. In other words, they were natural experiments already set up for us. As you frequently have been told it was first thought that the result being observed was euphoria; then it became apparent that it was much more than this.

Unfortunately, I was not paying proper attention when Doctor Cameron criticized other facets of our paper. I was busy about something else here and therefore I am unable to answer his objections seriatim. If there appears to be any obvious contradiction in the work I certainly shall be glad to discuss it with anybody who is confused about the report.

Doctor Romano asked something of the nature of the psychotic reactions in these patients and whether or not we have had the experience of giving steroid substances to schizophrenics or chronic alcoholic patients. We did give cortisone to a series of patients who had schizophrenia of the various types. The first one was a man who was in a catatonic stupor. Following the administration of the drug, he went into furore and had to be taken to the State Hospital where he was given electric shock and recovered. We then, in company with Doctor Rossen of the State Hospital System, gave various doses of cortisone to schizophrenics, gave some of them shock afterwards and some of them we treated without shock, but we were not able to arrive at any very definite conclusions.

On two occasions in office practice I did see patients who had had schizophrenic breakdowns earlier in their lives and who had adapted later on and made some kind of adjustment and were employed gainfully. One woman was a school teacher who did very well for 20 years. Upon being given cortisone for arthritis within the past year she broke down and evidenced a schizophrenic reaction. The other was a man who was given cortisone because of some fleeting arthritic symptoms and who evidenced a depressive reaction. It was found that he had had a depressive reaction earlier in his career. As long as a year and a half ago we notified the internists to be careful of peculiar mental reactions in some of these patients. It is something we will have to think of now. As we note people with various emotional reactions which are difficult to understand, we will have to inquire whether or not they had been given cortisone, just as we have had to inquire whether or not they had bromides or alcohol.

We have given cortisone and ACTH to chronic alcoholics. Doctor Rome has had much more experience with that than I have and I am unable to tell you too much about it.

I don't know how many of the questions I have been able to answer but I will be glad to discuss any that I missed with the questioner in private.

Dr. Abraham I. Jackman: First, I want to say I was pleasantly surprised that the new President of the A. P. A. has a touch of humor closely resembling Alexander Woollcott's humor, which I always considered the very highest type of humor. His comments were very apropos and were given in a manner that appealed to us. I want to thank him.

Now, concerning the statement that the percentage of recoveries was very close statistically to that reported for psychological methods, we have no argument with the statistics given by other therapists. However, we wish to point out that there was a marked shortening of time required for treating our cases and most of our cases were patients who had received anywhere from two to eight years of psychoanalytic therapy, or other forms of psychological therapy with no improvement, and in many cases, worsening of the condition progressively while under treatment. The treatment with carbon dioxide therapy, over a period of several weeks to several months, is usually sufficient to make a good adjustment for the average patient, and, for practical clinical purposes, to institute a state of recovery in the majority. Dr. Moriarity, mentioned in the paper, noted that many patients that had not responded at all to psychotherapy, that is, of the psychological kind, did respond very favorably when carbon dioxide was added to it.

As far as the classification is concerned, every psychiatrist who does a great deal of thinking has a classification of his own. This classification is the result of observing chemical therapy reactions, and is offered for what value anyone may make of it. We find it of great practical use for therapy purposes and we hope others will also.

Now, Dr. Hoch brought up an extremely important subject, the very heart and center of evaluating any new therapy, that is, the proper use of controls.

Now, Dr. Hoch may be aware of a series of treated cases, one of which was a set of controls that was presented at the A. P. A. meeting in Cincinnati this last May. At that time we did not use a gas that induced unconsciousness. We used compressed air which was mixed with enough carbon dioxide to give it a spicing effect. The results at that time showed strongly that although the same maneuver was gone through in the treatment of these controls as was gone through in treating patients with carbon dioxide and oxygen, that the psychological factors were of no particular value in achieving the results that we got with carbon dioxide treatment.

Since that time we have tried nitrous oxide on a series of thirty cases, and the results have been approximately the same. The psychological value of just inducing unconsciousness is very small. It has some value. In any procedure, the mere fact that we are giving them a treatment has a psychological effect. As Dr. Cameron pointed out, there can be improvement

in cases after getting the "electroencephalographic treatment". We all know those things happen, and we will get the same results with nitrous oxide or carbon dioxide spiced air.

Directly answering Dr. Hoch, nitrous oxide proved to us that it did not have the value in therapy that we would get from carbon dioxide-oxygen therapy. In fact, we got a percentage of improvement in the nitrous oxide treated cases of— well, out of thirty cases, we got two cases that felt very good afterwards and reverted a week or so later after therapy was stopped.

Our cases that improved with carbon dioxide oxygen therapy seemed to stick. We evaluated a series at the A. P. A. meeting. They showed that after two and a half years of treatment, they retained their gains in the vast majority of cases.

In Meduna's first series he reported 7 per cent relapses, and this 7 per cent still has not increased during the observation time which by now covers five years.

President Wortis: Dr. Merritt, I have one question for you. It reads: "Considering that children with primary behavior disorder are divisible into those with and without abnormal EEG's and that those with abnormal EEG's are further divisible into those whose EEG is determined by heredity, is determined by acquired factors, and those where etiology is not known, may not evaluation of drugs on behavior disorders require refinement in selection of the samples studied?"

Dr. Houston Merritt: The answer to that question is yes, and it has not been done.

NEUROSURGICAL TREATMENTS

Section VII

CHAPTER XXVI

EVALUATION OF LOBOTOMY WITH SPECIAL REFERENCE TO CHILDREN

JONATHAN M. WILLIAMS AND WALTER FREEMAN

The subject of psychosurgery by various methods has been extensively studied and reported fully and accurately in the last decade by many investigators. Almost all of this material deals with adults, and its extraction and rehashing here and at this time would add little to the general knowledge already gained of the subject. For purposes of summary, however, we may very briefly refer to two large series of cases adequately followed and assessed in regard to social competence after operation. The Freeman-Watts series of prefrontal lobotomy comprising 625 cases followed for three to fifteen years is shown in tables 21 and 22.

The Freeman series of transorbital lobotomy, some 500 cases followed for one to five years, is shown in tables 23 and 24. While many similar series have been reported, they are more or less confirmatory. Thus a base line is established against which other operative procedures may be tested. The details of these and similar series have been adequately reported by Freeman and Watts (1), Greenblatt, Arnot and Solomon (2), McKissock (3), Worthing, Brill and Wigderson (4), Moore and Winkelman (5), Yahn, Mattos Pimenta and Sette (6) and others. However, reports of the application of these therapeutic measures to mental disorders of childhood have been sparse. Today, we would like to discuss our experience with lobotomy in children.

Psychoses in children definitely exist, though at times they are confused with the hyperkinetic stereotyped activity of certain mental defectives. So true is this that probably the vast majority of these afflicted children are never treated by psychiatrists but are instead relegated directly to state institutions and schools for the feeble-minded. It is a little difficult to classify these psychotic children. Most are referred to by the vague term, "severe behavior problems". Early in this century Heller (7) attempted to create nosologic entity in the field of psychotic children. Since, in all respects, his cases exhibited behavioral abnormalities of a regressive nature which closely resembled those of schizophrenia, the concept of Heller's Disease per se has

TABLE 21

Prefrontal lobotomy—results three to fifteen years after operation

DIAGNOSIS	NUMBER	GOOD	FAIR	POOR	DEATHS	
					Per cent operative	No. later
		%	%	%		
Involutional depressions	116	61	19	18	2	28
Involutional psychoses, schizoid, paranoid	21	43	48	9		2
Manic depressive	9	67	33			
Obsessive states	81	56	31	9	4	8
Anxiety states	36	72	17	8	3	1
Pain syndromes	20	45	35		20	8
Schizophrenia						
catatonic	124	33	41	24	2	6
paranoid	87	35	33	32		4
hebephrenic	101	35	34	31		2
simple and child	19	10	58	32		1
Epilepsy	2		50		50	
Organic other	9	11	11	67	11	1
Total	625	44	32	22	2	61

TABLE 22

Prefrontal lobotomy—status of patients three to fifteen years after operation

DIAGNOSIS	NO.	EMPLOYED	KEEPING HOUSE	RETIRED	HOME	INSTITUTION	NO. DEAD
		%	%	%	%	%	
Involutional depression	86	2	50	12	22	14	30
Involutional psychoses, schizoid, paranoid	19		47	11	32	10	2
Manic depressive	9	11	56			33	
Obsessive state	70	29	24	4	30	13	11
Anxiety state	34	56	9		20	15	2
Pain syndromes	8	13			25	62	12
Schizophrenia							
catatonic	115	22	5		34	39	9
paranoid	83	16	13		32	39	4
hebephrenic	99	27	6		26	41	2
simple, child	18	11			50	39	1
Epilepsy	1	100					1
Organic other	7	14				86	2
Total	549	20	18	3	29	30	76

TABLE 23

Transorbital lobotomy—results one to five years after operation

DIAGNOSIS	NUMBER	GOOD	FAIR	POOR	DEATHS	
					Per cent operative	No. later
		%	%	%		
Involutional depressions	73	61	22	17		5
Involutional psychoses, schizoid, paranoid	31	57	33	10		3
Manic depressive	16	44	19	38		
Obsessive states	42	78	17	5		2
Anxiety states	24	83	17			
Pain syndromes	24	33	29	25	13	14
Schizophrenia						
catatonic	95	39	17	41	2	1
paranoid	105	37	26	36	1	
hebephrenic	68	24	17	59		1
simple, child	18	41	18	41		1
Epilepsy	1		100			
Organic	2			100	100	
Other	1				100	
Total	500	46	21	31	2	27

TABLE 24

Transorbital lobotomy—status of patients one to five years after operation

DIAGNOSIS	NO.	EMPLOYED	KEEPING HOUSE	HOME	INSTITUTION	NO. DEAD
		%	%	%	%	
Involutional depressions	68	19	39	23	19	5
Involutional psychoses, schizoid, paranoid	29	10	32	29	29	3
Manic depressive	17	19	31	19	31	
Obsessive states	39	26	41	31	2	2
Anxiety states	24	42	37	21		
Pain syndromes	7		28	43	29	17
Schizophrenia						
catatonic	93	14	21	20	45	2
paranoid	102	24	14	9	53	1
hebephrenic	68	10	6	25	59	1
simple, child	16	27	7	26	40	1
Epilepsy	1				100	
Organic	1				100	1
Other	1					1
Total	466	19	23	21	37	34

to a large extent been discredited. It is only recently that the term "schizophrenia" has been applied to these cases, although adding ten years to the age of the patient would leave no doubt as to the validity of the diagnosis based on behavioral characteristics. Schizophrenia in childhood is a malignant disorder usually developing insidiously and progressing unchecked to complete decadence of the personality. Children who are to develop it show the outstanding feature of seclusiveness, sometimes before the age of two. With gathering years the peculiarity becomes more marked and efforts to bring the child into social relationship with others are met with stubborn refusal. Another trait that stamps these children is their inability to react normally to praise and blame. Though at times they engage in or permit fondling or caresses, there is no real warmth or affection for others in these youngsters. A "noli-me-tangere" attitude exists and rages result from interruptions of the child's solitude. Rarely these children show lopsided intellectual precocity. Such achievement in the face of complete social inadequacy has given rise to the term "idiot savant". Occasionally this breakdown in the personality of a child is preceded by a short period of febrile illness with drowsiness for several days and at times a convulsion or two. The temptation is strong to attribute such subsequent aberrations of development as might occur to an "encephalitis", but this rarely can be proved to have been the case. Nor is this particularly pertinent, for patients with no indication of an encephalitic process present behavior problems that are just as great and with the prognosis just as bleak as in the postencephalitic psychosis of childhood.

We have considered for our study those children whose developmental history would indicate that they got off to a normal start in life only to become diverted and lost from the group and family largely in social adaptation and without evidence of progressive deteriorating organic disease. Several of the children in our series were originally suspected of having an essential organic disease but electroencephalography and air studies proved negative.

Psychosurgical procedures were undertaken in our series most often to ameliorate the intensely destructive behavior of these children. Less often did we hope to be rewarded with a return to normal family integration. Over a period of a decade there have come under our observation some dozen children who were operated upon between the ages of 4½ and 14 years. The clinical course was substantially the same in all these children. The early developmental history was not remarkable. They all rolled over, sat, walked and were in some cases toilet-trained at the usual time. Several however, never talked. One child had a history of a transitory febrile illness at about 2 months of age during which there was more than the usual drowsiness and irritability but the abnormalities of behavior were not no-

ticed until several years later. Deafness was suspected in a number of children who had not learned to talk but proven to be partially present in only one of our cases. It is probable that the early inattention manifested by these children toward others was responsible for the suspicion of hearing deficits.

In the older children of our series (9 to 14), somewhere around four or five years a subtle slow withdrawal or regression revealed itself. For example, one child named Sandra, previously considered unusually bright, had learned to spell her name on request. As her illness advanced, she progressively dropped off the last letter of her name and finally, when she got to the capital "S", ceased to talk altogether. Yet, after two years of absolute mutism, but before lobotomy, while out for a ride in the family car she suddenly said, "Where are we going, Daddy?" and nearly precipitated a highway accident. This behavior clearly indicates that the withdrawal was predicated more on an emotional-personality plane than in the realm of organic deterioration. Another aspect of this regression is the way these children seem to go backward down the ladder of life. Several of our subjects gradually ceased to walk upright and began to run on all fours.

At times the eccentricities of behavior take a violent and malignant turn. Destructiveness and incorrigibility are the outstanding features of these children. One of our patients, a boy of nine, had to be kept in a cage in the basement and was fed by his sorrowing parents through a small trap door in the wall.

The wildness and untameability of these youngsters has given rise to their designation as feral children, stories of whom appear as a skein woven into the lore of mankind from earliest times.

Our early experiences with standard prefrontal lobotomy by the Watts-Freeman technique were disappointing. Little or no modification of aberrent behavior was apparent. Later, more radical operations were done either as a second procedure or as an initial step. As a matter of fact, some of the intentionally most radical of our operations were performed on children, yet it is remarkable to note that the common findings of extreme inertia, incontinence and semistupor observed in adults following radical lobotomy were either extremely evanescent or did not occur in the immediate postoperative period in children. One boy in our series developed a temporary Parkinsonian picture and in addition had a bulldog jaw grip and forced grasping. This followed a lobotomy in the plane of the tuberculum sellae and in an adult would most certainly have resulted in death, yet this boy recovered sufficiently to work in his father's store for about two years until his careless and antagonistic behavior made hospitalization necessary. We agree with Yahn and Krynski (8) who attribute such findings to the greater recuperative power of the youthful brain.

In our series of twelve cases upon whom lobotomy was performed, one died the first post-operative day quite suddenly. Autopsy was denied. This boy had been a severe problem since the age of five. A second fatality occurred in a 4½-year-old boy, the son of a physician. This child was hyperkinetic and destructive to an extreme degree. Three weeks after lobotomy he contracted a primary pneumococcic meningitis and succumbed. Autopsy revealed clean surgical wounds.

Four of the twelve children operated upon had never learned to talk though the rest of their motor skills developed normally. Of the four who had never talked before operation, three have never talked since, and one child says one or two words in a flat way. Two of the mute children are in special training schools where they are reasonably obedient and have been taught simple duties or tricks.

Two other children, both girls, formerly had talked but by the time lobotomy was done had ceased to speak. One is still not talking two and one-half years after lobotomy and the other now uses simple phrases, seldom joined into sentences.

Destructive hyperkinesia was present in nine of the twelve children. As the result of lobotomy all were immediately quieted down. Only one patient returned to his former intolerable overactivity. In all the others, though restlessness returned, it was amenable to adult control and discipline. The maximum benefit to be achieved by lobotomy for this increased activity is seldom seen under six months after operation. Sleeping habits of these children are invariably improved following lobotomy. Toilet-training after lobotomy requires much patience on the part of the parents. Even then, however, "accidents" happen on occasion. Regard for personal safety is not greatly influenced by operation for, as a rule, these children exhibit as part of their psychosis a singular disregard for potentially dangerous situations such as traffic on a busy street, window heights, fire, etc. After operation these children still have to be protected in such circumstances. Vulgarity and excessive or abnormal interest in sexual matters was not observed in our series of children. We feel that this bespeaks merely an immaturity and lack of experience in these matters.

One child in our series, a girl of twelve, exhibited a somewhat different picture pre-operatively than the rest of the group. Instead of a schizophrenic withdrawal she manifested uncontrollable agitation and anxiety more like that seen in obsessive-compulsive tension states. She was not hallucinated but all her panicky productions indicated a profound terror about bleeding to death or being accidentally killed. In her case transorbital lobotomy was performed. Insulin shock therapy was subsequently attempted but without producing coma. She has since returned to school where she is doing satisfactory work. She shows no more agitation although there is an element of

silliness, hardly recognized by others as more than girlish shyness. Her personal habits and accomplishments have been unaltered by the surgery.

One other child not included in this series has been seen by us rather recently. Her psychosis was rather typical of schizophrenia but marked by loud and terrifying auditory hallucinations. Bilateral ablation of the amygdaloid nuclei was done and has resulted in almost complete suppression of the hallucinations although the other features of her disorder are largely unchanged. Her case is part of another report.

DISCUSSION

From the foregoing it may be seen that psychoses of childhood are indeed malignant disorders. Our experience with lobotomy in these cases has not been very encouraging although some alterations, mostly favorable, have been achieved in several instances. Certainly, the results in children compare unfavorably with results of psychosurgery in adults. We believe there are two main reasons for this: There is probably a lack of the more complete organization or differentiation in the child's brain as compared to the adult, representing a stage in ontological development comparable to the more diffuse cortical representation of functions in the brains of lower animals. Therefore, even extensive prefrontal lobotomy may fail to sever that critical moiety necessary for a successful lobotomy. Secondly, a child's life experiences fall far short of the general experiences of adults. After lobotomy, all patients must fall back on personal experience as a way of existence and survival. The adult can do this and make his way. The child cannot, for his life has been so short, so protected in the family, and so devoid of the problems of maturity that after lobotomy he has no sure knowledge of his own to which he may turn.

CONCLUSION

A discussion of lobotomy in children, based on personal experience with twelve cases, is presented. It may be concluded from this series that restoration of the child to a normal life cannot be expected, but that certain favorable modifications, mostly in the realm of excessive motor activity, may be achieved.

REFERENCES

1. Freeman, W. and Watts J. W.: Psychosurgery, 2nd ed. Springfield, Charles C Thomas, 1950.
2. Greenblatt, M., Arnot, R. and Solomon, H. C.: Studies in Lobotomy. New York, Grune and Stratton, 1950.
3. McKissock, W.: Rostral leucotomy. Lancet, *2:* 91–94 (July 21) 1951.
4. Worthing, H. J., Brill, H. and Wigderson, H.: Evaluation of immediate and late results of prefrontal lobotomy in 600 cases, including a case of post-encephalitis and other organic states. Am. J. Psychiat., *108:* 328–336 (Nov.) 1951.

5. Moore, M. T. and Winkelman, N. W.: Some experiences with transorbital leucotomy. Am. J. Psychiat., *107:* 801–807 (May) 1951.
6. Yahn, M., Mattos Pimenta, A. and Sette, A., Jr.: Tratamento Cirurgico das Molestias Mentais (Leucotomia). São Paulo, 1951, Edigraf. pp. 293, Prologo por Egas Moniz.
7. Heller, T.: Ueber Dementia Infantalis. Ztschr. F. die Erforschung u. Behandlung des jugendl. Schwachsinns, *2:* 17–28, 1908.
8. Yahn, M. and Kryuski, S.: Leucotomie pre-frontale chez les enfants et les adolescents. Jorn. Brasileiro de Psiquiatria, *1:* 11, 356–361, 1951.

Note: Time does not permit extended references to the published experiences of others working with lobotomy in children. Below is listed the complete bibliography of such publications through August 1951:

1. Angus, L. R.: Prefrontal lobotomy as a method of therapy in a special school. Am. J. Ment. Defic., *53:* 470–476 (Jan.) 1949.
2. Condrau, G. and Klinger, M.: Prafrontale Leukotomie beierethischer Idiotie. Zschr. f. Kinderpsychiat, *16:* 133–139, 1950.
3. Engler, M.: Prefrontal leucotomy in mental defectives. J. Ment. Sc., *94:* 844–850, 1948.
4. Euziere, J., Lafon, R. and Gros, C.: Premiers résultats des topectomies frontales bilaterales dans le traitement de l'agitation chez les arrières graves. Arch. franc. Pediat., *6:* 649, 1949.
5. Feld, M.: La Topectomie prefrontale. Arch. Hosp. Par., *21:* 78, 1949.
6. Freeman, W. and Watts, J. W.: Schizophrenia in childhood; its modification by prefrontal lobotomy. Dig. Neurol. and Psychiat., *15:* 202–219 (April) 1947.
7. Freeman, W. and Watts, J. W.: Psychosurgery, 2nd Ed. Springfield, Ill., Thomas, 1950.
8. Heuyer, L., Lebovici, S. and Feld, M.: Essais de Psychochirurgie Infantile. Rapport Congres Neur., Alien. Langue Franc., Marseille, 1948.
9. Klein, M. R. and Tardieu, G.: La Leucotomie chez l'enfant et ses indications. Sem. Hop. Paris, *25:* 113, 1949.
10. Mackay, G. W.: Leucotomy in the treatment of psychopathic feebleminded patient in a state mental deficiency institution. J. Ment. Sc., *94:* 834–843, 1948.
11. Mattos Pimenta, A.: Leucotomia pre-frontal nas criancas. J. Med. Porto., *12:* 470, 1943.
12. Schultz-Henke: Psychiatertagung, Berlin, mai 1948. Cité par Kobcke, H.: Problème der Psychochirurgie, 1950.
13. Williams, J. M.: Lobotomy in children. Dig. Neurol. & Psychiat., *17:* 420–421, 1949.
14. Yahn, M., Krynski, S., Mattos Pimenta, A. and Sette, A., Jr.: Leucotomia prefrontal em menores. Arq. Neuro-Psiquiat., S. Paulo, *7:* 349–370, 1949.
15. Id: Sobre a Leucotomia Frontal de Freeman e Watts em Criancas. Congres de Psychochirurgie, Lisbonne, 1949, Atica, 129–145.
16. Ziegler, L. H. and Osgood, C. W.: Edema and trophic disturbances of the lower limbs complicating prefrontal lobotomy. Arch. Neurol. and Psychiat., *53:* 262–268, 1945.

CHAPTER XXVII

CRITERIA AND EXPERIMENTAL DESIGN FOR EVALUATING RESULTS OF LOBOTOMY

RICHARD L. JENKINS AND JAMES Q. HOLSOPPLE*

The Veterans Administration has for the last five years been officially and keenly aware both of the improvement often shown by psychotic patients after prefrontal lobotomy and of the serious and irreversible nature of the operation. Within as well as outside of the VA there have been vigorous and continuing arguments concerning the desirability of *any* surgery of this nature. Even when benefits are conceded, there is still debate concerning the selection of patients and the choice of operative procedure. As of September 1950 there had been nearly 1,500 prefrontal lobotomy operations performed within the VA. An attempt to appraise in retrospect the results of these operations did little more than confront us with a paradox: the clear consensus that benefits did accrue to operated patients and the fact that such benefits were *not* reflected with equal clarity in discharge rates or in social and economic independence. We are now carrying on a research project designed to capitalize on the widespread resources and commitments of the VA in the hope that we may arrive at more accurate and more universally acceptable judgments than are presently possible of which patients, if any, will profit by lobotomy, and what operative procedure is most likely to benefit a given patient.

The design of our research is summarized in table 25. In undertaking such a research project, we were immediately confronted by an ethical conflict. Research design calls for two groups, operated cases and controls, as nearly identical as possible. This involves operating on patients or withholding the operation in the interest of the research project rather than the patient. This runs contrary to the accepted morality of medical practice and we were unwilling to urge it on the staffs of our hospitals in so serious a matter as this. The patient to be lobotomized is therefore selected through a lobotomy board in accordance with the normal procedures of the Veterans Administration. A control series is selected as closely similar to the operated series as possible. The differing views and lack of clear definition of indications for lobotomy have operated in our favor by diminishing any problem of

* From Veterans Administration, Central Office, Washington, D. C.

systematic differences between operated and control series. We have utilized a prognostic scale for matching the series and believe our controls to be reasonably satisfactory, despite certain admitted lacks.

Both the control and the operated patient are examined by neurologists, psychiatrists and psychologists. In order to reduce the effect of desire of staff members to see improvement after lobotomy on estimates of the patient's condition we have, wherever possible, arranged for the inclusion of examinations by visiting consultants who have no therapeutic responsibility for the patient under examination.

The operations performed in each hospital are divided into two groups. All hospitals perform a "standard lobotomy" under direct vision with bilateral trephine openings on each side of the midline. The posterior margin of the opening is 1 cm. anterior to the coronal suture and the procedure follows as described by Poppen (Technique of prefrontal lobotomy, J. Neurosurgery, *5:* 514, 1948). Each hospital alternates these standard operations with one variant as agreed upon by that hospital and seeks to keep all other conditions of observation and treatment consistent with those for the standard operation.

TABLE 25

Outline of VA laboratory research project

	OPERATED PATIENTS	CONTROLS
Examinations	Objective (by staff), evaluative (by consultants), general medical, psychiatric, neurological, psychological	Same as for operated patients
Operations	Standard lobotomy, variants	None
Post-operative treatment	Rehabilitation program	All treatment given operated patients considered for controls and given when suitable
3-month post-operative examination	Same as pre-operative examinations	Same as for operated patients
Follow-up	Annual examinations	Same as for operated patients

Subsequent to the operation an effort is made to treat the control patient in the same manner as the operated member of the pair. This is usually difficult. The question involved, in *reductio ad absurdum*, is "If the operated patient dies must we bury the control?" With respect to such questions our position has been that burial for the control *must be considered*, but need be carried out only if it is appropriate to the condition of the control patient.

We are now prepared to report some of our initial observations as of the 3 months period following the standard operation. The sample represents the first 30 cases with their controls from 3 hospitals.

In order to permit quantitative comparisons we are using, among other techniques, 3 sets of scaled judgments. Table 26 illustrates such a scale, and the preoperative and postoperative distributions of operated series and controls. This scale, and the others here presented, have been selected from those which reflect most clearly the changes observed.

This scale is one of 46 appearing in Part I of the "Northport Record" devised by Dr. Lorr and other of our colleagues. It is designed to record the judgment of a ward physician or psychiatrist, based on interview. Part II of the "Northport Record" includes scales which are completed by the psychiatrist or psychologist after interviewing ward personnel who know the patient well. The uniformity with which patients can be described in

TABLE 26

C-11. ATTENTION: DIRECTION	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Appears to be constantly preoccupied with self, whether anxiously, thoughtfully or boastfully	*10*	3	7	7
2. Inclined to be preoccupied with own inner wishes and needs	**19**	**16**	**20**	**20**
3. Stimulated equally by inner ideas and needs and by objects and things going on around him. Seldom self-preoccupied	1	*10*	1	2
4. Inclined to be more attentive to and distracted by things going on around him. Seldom self-preoccupied	—	1	1	1
5. Conspicuously bound to or affected by things going on around him. Highly distractible by changes in the environment	—	—	1	—

these scales may be illustrated from actual trial as follows: When a number of observers rated the same patient independently on a typical scale—such as the one illustrated—76 per cent of the ratings agreed exactly, 18 per cent differed by one scale point, 5 per cent by two scale points, and only one per cent by as many as three scale points.*

This table indicates that both operated and control patients are characterized preoperatively as "inclined to be preoccupied with own inner wishes and needs". The control group shows essentially no change but the operated group clearly moves toward more receptiveness and attention to what is going on around them.

* This scale has been superseded by The Multidimensional Scale for Rating Psychiatric Patients, Form for Hospital Use, developed by Maurice Lorr and Richard L. Jenkins.

The shifts of individual patients are shown more clearly in table 27. Here it is apparent that a relatively large number of individual control patients remain unchanged in the respect rated. Seventeen of the operated patients are "less preoccupied" with their own affairs; only 5 of the control patients are so rated. If a difference of this order holds up for only a few successive samples of this size it is clear that our problem will no longer be *whether* the

TABLE 27

C-11. POSTOPERATIVE CHANGE IN PREOCCUPATION WITH SELF	OPERATED	CONTROL
Toward more preoccupation	3	4
Unchanged	10	21
Toward less preoccupation	17	5

TABLE 28

C-17. EMOTIONAL BEHAVIOR—DISHARMONY	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Patient's thought and feeling appear to be consistent with each other	4	*10*	7	*11*
2. There is a discernible lack of harmony between what the patient says and the feeling he shows	4	**16**	*11*	6
3. There is marked lack of harmony between patient's thought and feeling	**15**	4	*10*	*11*
4. Patient's thought and feeling seem totally unrelated to each other (e.g., reports, smiling, that he was tortured with blow torches all night)	5	—	2	1

TABLE 29

C-17. POSTOPERATIVE CHANGE IN EMOTIONAL DISHARMONY	OPERATED	CONTROL
Toward more disharmony in thought and feeling	3	4
Unchanged	5	19
Toward less disharmony in thought and feeling	20	6

patient with a standard lobotomy is likely to be rated as less preoccupied with his own inner needs but rather *why* he is so rated.

Another item from the same schedule deals with ratings of disharmony between thought and feeling (table 28). Here we note that the control group stays relatively constant whereas the operated operated group, although showing discernible lack of harmony postoperatively, have manifested improvement in this regard (table 29).

Comparison of *individuals* showing a shift in rating are more striking than the distribution of group scores.

Anxiety ratings are illustrated in tables 30 and 31. Ratings on the Northport Record based on interview with ward personnel show similar

TABLE 30

C-16. ANXIETY—OBSERVED BEHAVIOR	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Shows no signs of anxiety, e.g., fidgeting, sweating, tension, tremors, etc.	*10*	18	*12*	*16*
2. Shows some anxiety but only to the degree expected by the circumstances	4	*10*	*10*	*8*
3. Shows more anxiety than called for by circumstances	12	—	4	4
4. Agitated or panicky, shows marked apprehension	3	2	2	1

TABLE 31

C-16. POSTOPERATIVE CHANGE IN OBSERVED ANXIOUS BEHAVIOR	OPERATED	CONTROL
Toward more anxiety	4	7
Unchanged	10	13
Toward less anxiety	15	8

TABLE 32

D-58. ACTIVITY—LEVEL OF SKILL	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Has no regular activity	19	3	*10*	*9*
2. Has a regular activity which requires little skill (making beds, cleaning floors, making rugs in O.T.)	9	21	17	18
3. Has a regular activity which requires a fair amount of skill (clerical work, drafting, learning French, making elaborate sculptures in O.T.)	—	3	3	2

changes. Table 32 is based upon such interview rather than direct observation of the patient. This table shows a deplorable but understandable failure of our efforts adequately to match operated and control groups. The operated patients were less likely to have engaged in any regular activity no matter how little skill might be involved. However, it is clear that the

postoperative level of the control groups remained unchanged whereas the operated groups reached the level of the control group after operation (table 33). Seventeen of the operated group improved their intra-hospital work status as compared with only 4 of the control group. One of the operated

TABLE 33

D-58. POSTOPERATIVE CHANGE IN LEVEL OF ACTIVITY	OPERATED	CONTROL
Toward no activity	1	3
Unchanged	8	22
Toward regular skilled work	17	4

TABLE 34

A—FLEXIBILITY	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Promptly and appropriately modifies his behavior to fit the situation. Accepts compromises where needed. Responds to the needs and demands of specific situations which call for new or different ways of doing things	1	1	2	1
2. A little slow or reluctant to modify his behavior to fit the situation but does so without much difficulty	4	19	8	11
3. Slow and reluctant to modify his behavior to the demands of a situation and does so only with difficulty. Tends to be set in his ways and to insist on rigid ways of doing things	7	5	12	9
4. Very slow or reluctant to modify his behavior to fit the situation and does so only with the greatest difficulty	14	4	8	6
5. Sticks rigidly to his own ideas and ways of doing things. Refuses to compromise or to alter his patterns of work, play, or thought to the needs of others or the requirements of a situation	4	1	—	3

group lost ground as compared with 3 of the control group. Again, the fact of change, 22 to 8, is clear. The direction is in favor of lobotomy.

In order to compare psychiatrists' judgment pre- and post-operatively a series of 17 scales were designed based on the changes which previous observers have attributed to the operation. These scales have been useful, not only for the purpose for which they were designed, but also as a basis for reporting changes inferred from projective material obtained from psychological tests. F.N. The purposes of these scales appear now to be better

served by the Multidimensional Scales Form for Outpatient use developed by Maurice Lorr, Richard L. Jenkins, James Q. Holsopple and Eli A. Rubenstein.

The change in flexibility, as noted by the psychiatric examiner, is striking (table 34). The controls appear to be unchanged. The operated patients

TABLE 35

A—POSTOPERATIVE CHANGE IN FLEXILBILITY	OPERATED	CONTROL
Toward greater rigidity	4	10
Unchanged	4	15
Toward greater flexibility	22	5

TABLE 36

A—EMOTIONAL REACTIVITY	OPERATED		CONTROL	
	Pre	Post	Pre	Post
1. Apathetic. Shows little or no sign of feeling to any situation	10	4	4	4
2. Phlegmatic. Under-reacts or shows inadequate feeling for a situation	12	14	14	13
3. Reacts with a little less than adequate feeling to a situation	3	9	9	7
4. Reacts with a little more than adequate feeling to a situation	2	2	1	1
5. Moderate emotional over-reaction to situations	3	1	—	4
6. Marked emotional over-reaction, likely to be explosive or dramatic. Reaction far beyond demands of situation	—	—	2	1

TABLE 37

A—POSTOPERATIVE CHANGE IN EMOTIONAL REACTIVITY	OPERATED	CONTROL
Toward apathy	7	6
Unchanged	10	17
Toward responsiveness	13	7

shift markedly, in their slowness and reluctance to modify their behavior (table 35). Individual shifts are also conspicuous.

Another scale for the psychiatrist's judgment reflects emotional reactivity (table 36). From apathy, the operated group moves toward, but does not quite reach, normality—remaining at best on the side of a little less than adequate emotional response. The control group, initially less apathetic than the operated, remain unchanged (table 37). The individual shifts re-

flect the group differences; 13 operative patients are reported as more reactive, compared with only 7 of the controls so described.

Psychological tests and measurements yield important data concerning relatively few of the type of patients normally lobotomized within the VA. But those who are accessible to tests have already supplied us with material which, although not yet statistically important, is highly challenging.

Two techniques not heretofore used are standard procedure in our project and hence noted at this time: A projective sentence completion form devised by one of us* with Florence Miale; and the Holsopple concept formation test which follows in the tradition of Ach, Vigotski, and Sakharov, but is free from some of the more serious defects of earlier techniques.

Our sentence completions make it relatively easy for the subject to reveal his attitudes, needs and conflicts without the interfering trauma of knowing that he is doing so. It is not a test device which can be easily scored by a clerk, but skillful, experienced, independent observers can draw inferences concerning basic personality structure and dynamics with a surprisingly high degree of consistency.

The inferences so drawn qualify the ratings of behavior previously reported to a highly important degree. They raise definite questions about what might otherwise be taken to be the unequivocal "healthiness" of some of the changes which appear to be "improvement".

We found, after inspection of three sets of records, that we had no difficulty in selecting the post-lobotomy sentence completion performance from the pre-lobotomy performance, and that we could distinguish the pre- and post-lobotomy completions of individual sentences with a respectable batting average.

The shift in sentence completion from pre-operative to 3-month post-operative is a type of shift suggesting reduction of internal conflict, reduction of extent or complexity of feeling-quality, reduction of awareness of and sensitivity to feelings of others, reduction o' concern with or responsiveness to moral scruples or other acquired internal controls. The new orientation is an emotionally unresponsive, extroverted, practical, laconically expressed "realism" which does not take the world too seriously – perhaps sometimes not seriously enough.

Incoherence and blocking may be relieved, presumably by reduction of inner tensions with resultant greater responsiveness to external stimuli and more adequate, although more simple and direct responses.

The following examples are illustrative. Before lobotomy, one of our patients completed the sentence, "The best thing about old age" with the words, "*that doesn't have long to live.*" After lobotomy, his completion was,

* James Q. Holsopple.

"The best thing about old age is *social security.*" This shift really epitomizes a typical result of the operation of cutting the Gordian knot. Before lobotomy the same patient gave the completion, "People shouldn't *commit crimes.*" After lobotomy, it changed to, "People shouldn't *take life too serious.*" Before lobotomy, we find the completion "to be a good liar one must *tell big lies.*" This is, after all, one definition of a good liar. After lobotomy, the response is more practical. "To be a good liar, one must *practice.*" Possibly, Gregory Zilboorg was literally correct in characterizing prefrontal lobotomy as "Machiavellian treatment". We find "The nicest thing about being a child *is that they have few worries,*" shifts to "The nicest thing about being a child *is you usually have your own way.*" "People refrain from murder only because *it is a crime,*" becomes "People refrain from murder only because *of the law.*" There would be more divorces if *each strives to get along,*" is released to "there would be more divorces if *it was easier to get.*" "When a person is wounded *he is hurt,*" becomes "When a person is wounded *he is sent to a hospital.*" "If one cannot own *what he wants he is unhappy,*" proceeds to "If one cannot own *what he wants he strives to buy it.*" The significance of the testing situation itself changes from, "Tests like this *are not taken often,*" to "Tests like this *are amusing.*"

These responses are, of course, selected because they typify a shift broadly discernible in the sentence completion, through which a projective test gives indication of the release of the blocking ambivalence and conflict of a functional psychosis through the creation of an organic deficit.

In our concept formation test, it is possible to distinguish between "improvement" in the sense of greater flexibility in the process of generalizing on the one hand, and on the other hand "improvement" which represents nothing more than a docile willingness to go through the motions of being tested. Although statistical inferences are not yet warranted, no patient has yet shown greater flexibility of conceptualization whereas a few have clearly become more inept in the formation of concepts involving form, color, and number.

We do not share the conclusion of some other investigators that the functions of the frontal lobes are mythical. They assuredly are complex and our inferences should be cautious. However, with pooled results, careful observation, and awareness of our semantic barriers, we believe that progress in understanding the effects of lobotomy will continue.

CHAPTER XXVIII

PHYSIOLOGICAL CHANGES PREDICTIVE OF CLINICAL OUTCOME FOLLOWING FRONTAL LOBE SURGERY

Effect of Frontal Lobe Surgery upon Systolic Blood Pressure Response to an Autonomic Drug (Mecholyl)

HARRY C. SOLOMON AND MILTON GREENBLATT

Previous study has led to the conception that psychotic patients vary in their response to autonomic drugs (ephinephrine and mecholyl) and that the differences in reaction to the drugs were of considerable value in predicting the clinical effect of electric shock treatment. Patients with marked response to intra-muscular mecholyl, for example, usually responded dramatically to a series of electric shocks. The mecholyl reaction in fact was often a better prognostic criterion than clinical judgment of experienced psychiatrists. The present study was undertaken for the purpose of establishing whether or not the physiological criteria for prognosis developed in relation to electric shock held true for a group of chronic schizophrenic patients, generally characterized by a poor response to somatic procedures and finally subjected to various types of frontal lobe surgery.

This report deals only with the reaction of the patients to 10 mg. of mecholyl given intramuscularly. The epinephrine response (which is more difficult to evaluate than mecholyl and in previous studies has given less differentiating results) was omitted. Altogether 38 chronic psychotic patients who received lobotomy operations were studied; 19 of these patients were studied before and at one to three months after operation, and another 19 patients were studied before and at four to six months after operation. The clinical characteristics of these patients need little discussion they were all chronic psychotic individuals, the vast majority bearing the label schizophrenia, who had failed to respond to all previous treatment and after long illness or hospitalization were judged reasonable candidates for psychosurgery. A more detailed statistical analysis of the makeup of the group is available elsewhere (1).

The four, and only four, specific physiological variables considered in this report are as follows:

(1) *Resting systolic blood pressure.* This is the systolic blood pressure, as obtained by the familiar auscultatory method, after a minimum of 20 minutes of rest in the lying position during which the systolic blood pressure had stabilized itself.

(2) The *maximum fall* of blood pressure following the intramuscular injection of 10 mg. of mecholyl (below a projection of the resting blood pressure level) which occurred during the 25 minute period of observation. For purposes of brevity this is often referred to as the "mecholyl fall".

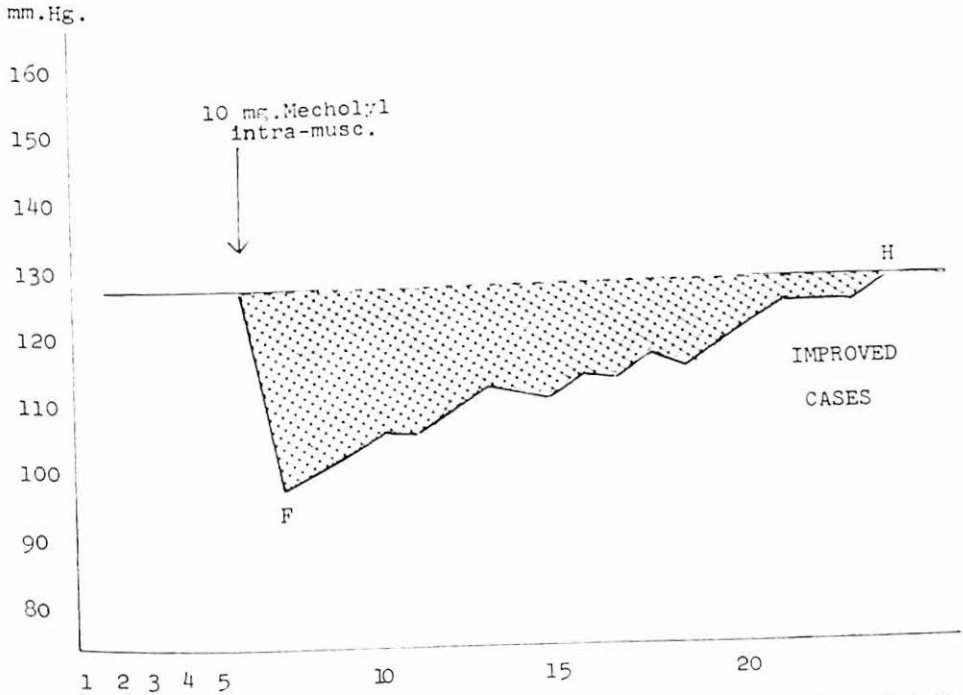


Fig. 27. Diagrammatic illustration of preoperative response to 10 mg. mecholyl of clinically improved cases. The improved cases showed a higher resting systolic blood pressure, a greater fall (F) in blood pressure after injection of mecholyl, a larger "area" of blood pressure displacement from the projected baseline ("area" is cross-hatched), and a longer "recovery" time (time from injection of mecholyl to point H).

(3) The "*area*" under a projection of the resting blood pressure level demarcated by the fall in blood pressure due to injection of mecholyl. The greater the fall in blood pressure and the longer the time required for return of blood pressure to the normal level the greater the area described. Conversely, the less the fall in blood pressure and the quicker the return to normal the less the area under the projected baseline. This function is often referred to simply as "area" (figs. 27 and 28).

(4) The *time* from injection of mecholyl to the point of first intersection

of the projected resting baseline by the blood pressure curve. In other words, this is the "recovery time", sometimes also referred to as "homeostasis time".

In addition to the above specific and relatively easily measureable variables, the blood pressure curves were also inspected in a gross way and then divided into groups. A detailed discussion of these groups and their characteristics may be found in previous publications (2, 3). Essentially, the analysis in this instance was to compare cases with Group VI autonomic pattern with all the others. Since the essential characteristics of Group VI cases is a

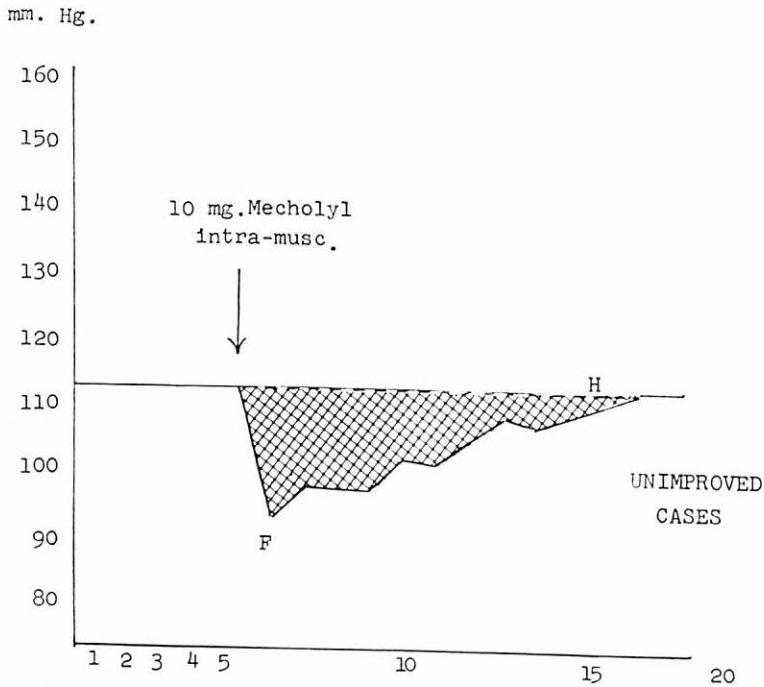


Fig. 28. Diagrammatic illustration of preoperative response to 10 mg. mecholyl of unimproved cases (see legend, fig. 28).

marked, prolonged response to intra-muscular mecholyl, this analysis essentially compares the *more reactive* with the *less reactive* patients.

RESULTS

Overall changes in the physiological variables following frontal lobe surgery

Resting systolic blood pressure. Table 38 gives the overall changes for the physiological variables at 1 to 3 months and at 4 to 6 months. There was a mean fall in systolic blood pressure at 1 to 3 months of 13.2 mm. Hg. This change though small was so consistent that the significance is ex-

tremely high ($p < .001$). At 4 to 6 months the mean blood pressure was 6.7 mm. Hg lower than the preoperative level, also a significant difference ($p < .05$). The tendency of the resting blood pressure to return towards the normal level with passage of time should be noted. At the 4 to 6 mon hs level the resting blood pressure had returned about half way to the original level as compared with the 1 to 3 month value. These findings are essentially in agreement with the careful work of Chapman et al. (4) who, at one year after lobotomy, found no significant difference between the resting blood pressure level at that time and the preoperative values.

Maximum fall of the blood pressure following mecholyl ("mecholyl fall"). The average max'mum fall in blood pressure after mecholyl injection was 24.3 mm. Hg preoperatively; after operation, at the 1 to 3 month period the

TABLE 38

Changes in physiological variables following frontal lobe surgery

	1–3 MOS. (19 CASES)						4–6 MOS. (19 CASES)					
	(1) Pre-lob.		(2) Post-lob.				(3) Pre-lob.		(4) Post-lob.			
	Physiological variable											
	Mean	S.D.	Mean	S.D.	2–1	t	Mean	S.D.	Mean	S.D.	4–3	t
Systolic blood pressure	121.9	13.1	108.7	11.1	−13.2	4.23*	127.2	21.1	120.5	17.0	−6.7	2.14†
"Mecholyl fall"	24.3	8.3	22.3	7.1	−2.0	—	24.2	13.1	19.6	11.1	−4.6	2.11†
"Area"	31.2	24.1	24.9	24.1	−6.3	—	36.0	39.5	27.7	+3.2	−8.3	—
"Homeostasis time"	15.1	12.1	12.3	7.8	−2.8	1.53	15.3	9.4	11.2	7.9	−4.10	1.52

* p. <.00.
† p. <.05.

drop was slightly less marked (22.3 mm. Hg). At 4 to 6 months the average fall was 19.6 mm. Hg. There was a trend towards progressive decrease in blood pressure lowering effect of mecholyl with time; however, only the 4 to 6 months difference from preoperative score is significant ($p = < .05$).

"Area". A decrease in "area" was noted for both post-operative periods (1 to 3 months and 4 to 6 months); however, the changes were not statistically significant.

"Recovery time". An average of 15 + minutes was required preoperatively for return of the blood pressure to normal levels. This was reduced some 2.8 minutes at 1 to 3 months and 4.10 minutes at 4 to 6 months; again a trend was noted although the changes were too small to be of statistical importance.

Summary. A definite and statistically significant fall in systolic pressure occurs 1 to 3 months following operation, with tendency towards recovery which, however, is not complete by 4 to 6 months.

A slight tendency is noted for reduction in severity of mecholyl reaction after frontal lobe surgery—i.e., systolic blood pressure fall, "area", and "recovery time" are all less than preoperatively. While the basal blood pressure level, which is first lowered by operation, tends to return towards the preoperative level with passage of time; the mecholyl response tends to diminish progressively with passage of time.

TABLE 39

Relationship of preoperative physiological status to clinical outcome following frontal lobe surgery

PREOPERATIVE STATUS ON PHYSIOLOGICAL TESTING	(1) IMPROVED GROUP (21 CASES)		(2) UNIMPROVED GROUP (16 CASES)		(2) − (1)	t
	Mean	S.D.	Mean	S.D.		
Systolic blood pressure	129.2	19.1	116.8	12.1	−12.4	2.23*
"Mecholyl fall"	27.1	10.1	19.2	9.6	−7.9	2.36*
"Area"	43.3	37.0	21.3	20.1	−22.0	2.19*
"Homeostasis time"	17.9	7.8	12.1	8.6	−5.8	2.02†

* p <.05.
† p. <.10.

Relationship between preoperative physiological status and clinical outcome following frontal lobe surgery

A summary of the relationship between the preoperative physiological findings and clinical outcome following frontal lobe surgery is presented in table 39. The cases are divided into the groups—improved and unimproved. Evaluation of clinical change following operation was made independently by the psychiatrist attached to the project (Dr. Julius Levine) and without knowledge of the physiological results. The physiologists, on the other hand, worked without knowledge of the clinical evaluation.

Resting systolic blood pressure. The mean resting systolic blood pressure level was significantly higher for the improved group than the unimproved group (129.2 versus 116.8 mm. Hg). The difference of 12.4 mm. Hg was significant at the 5 per cent level.

Maximum blood pressure fall after injection of mecholyl. The maximum fall of systolic blood pressure after injection of mecholyl was significantly greater for the improved group than the unimproved group. The difference, 7.9 mm. Hg, was significant at the 5 per cent level.

"Area". The area under the projection of the resting blood pressure level

demarcated by the fall in blood pressure after mecholyl was significantly greater for the improved group than the unimproved group. The difference of 22.0 was significant at the 5 per cent level.

"*Recovery time*". The improved group required a longer time for return of the blood pressure to normal (following injection of mecholyl) than did the unimproved group (17.9 minutes as opposed to 12.1 minutes). The difference of 5.8 minutes was significant only at the 10 per cent confidence level.

Summary. All data point strongly to the fact that the clinically improved group shows *preoperatively* a higher resting blood pressure level and a more marked blood pressure response to intra-muscular mecholyl than the unimproved group. The "mecholyl reactive" or "mecholyl sensitive" patients, therefore, have the greater recovery potential or the better prognosis. This

TABLE 40

Changes in physiological variables following frontal lobe surgery in relation to clinical outcome

	(1) IMPROVED GROUP (21 CASES)		(2) UNIMPROVED GROUP (16 CASES)		(2) − (1)	t
	Mean change	S.D.	Mean change	S.D.		
Systolic blood pressure	−13.3	110.9	−3.0	12.2	10.3	2.60*
"Mecholyl fall"	−6.4	8.2	+2.0	8.0	8.4	3.04†
"Area"	−1.6	32.0	+4.9	20.1	6.5	—
"Homeostasis time"	−6.5	8.7	+0.5	9.8	7.0	2.25‡

* p. <.02.
† p. <.01.
‡ p. <.05.

is in essential agreement with the findings previously reported concerning prognosis with electric shock treatment (5).

Changes in physiological variables in relation to clinical outcome following frontal lobe surgery

Table 40 attempts to answer the question as to what physiological changes may parallel clinical changes.

Resting systolic blood pressure fell more for the improved cases than for the unimproved cases. This difference of 10.3 mm. Hg was significant at the 2 per cent level.

Fall of blood pressure following mecholyl *decreased* in the case of the improved group but *increased* in the case of the unimproved group. The difference in change is significant at the 1 per cent level.

"*Area*" decreased very slightly for the improved group and increased slightly more for the unimproved group. Although the changes were in opposite directions, the difference was not statistically significant at the 5 per cent level.

Recovery time decreased an average of 6.5 minutes for the improved cases and increased an average of 0.5 minutes for the unimproved cases. The difference was significant at the 5 per cent level.

Summary. The changes for the improved group and the unimproved group were clearly different. The improved group showed a greater fall in resting blood pressure than the unimproved group, and a definite tendency towards decrease in the mecholyl response. The unimproved group shows less of a fall in blood pressure after mecholyl and a tendency towards increase in mecholyl responsiveness. The opposite directions of physiological change for these two clinical groups is striking. *Physiological change towards normaley seemed to characterize the improved cases whereas little overall change or change towards the abnormal characterized the unimproved cases.*

Changes in physiological variables of specific autonomic groups following frontal lobe surgery

Previous study has focused attention upon a group of cases possessing an autonomic reaction pattern characterized chiefly by elevated basal blood pressure, and marked prolonged response to mecholyl. This physiological pattern has been known as Group VI. It is fairly common among acute psychotic patients admitted to the Boston Psychopathic Hospital, and less common among chronic psychotic cases. For acute cases it has already been shown (5) that a Group VI autonomic pattern is a highly favorable sign. Such patients respond rapidly to a few electric shock treatments; others tend to recover either spontaneously or with psychotherapy. Diagnostically the predominant category included in Group VI is the involutional psychosis, although the typical physiological response may be shown by patients bearing almost any diagnostic label. It was of great interest, therefore, for us to study changes in the physiology of Group VI cases and also to observe whether or not a Group VI type patient still carried a relatively good prognosis despite having failed to benefit by other forms of treatment. Doubtless, the reader is already prepared for the findings to be described in this section, for Section B above (which discusses the preoperative findings for improved and unimproved cases) has already associated with the improved cases a physiological response type which in all essential aspects resembles the Group VI pattern.

Comparing the preoperative physiological pattern of Group VI cases (table 41) with the improved cases (table 39) one notes that the Group VI cases have a slightly higher initial blood pressure (132.0 versus 129.2 mm.

Hg), a greater maximum fall after mecholyl (29.7 versus 27.1 mm. Hg), a larger "area" (59.2 versus 43.3), and a longer "recovery time" (24.6 minutes versus 17.9 minutes). The Group VI cases show an exaggerated version of the physiological pattern possessed by the improved cases.

Systolic blood pressure. Group VI cases had a relatively high blood pressure level which dropped significantly after operation ($p < .02$). The other autonomic groups I, II, III) (5)[1] showed *lower initial level and less of a drop after operation.* The blood pressure changes for the two autonomic groups after operation, however, were not significantly different.

TABLE 41

Changes in physiological variables of specific autonomic groups following frontal lobe surgery

	(1) PRE-LOBOTOMY		(2) POST-LOBOTOMY		(2) − (1)	t
	Mean	S.D.	Mean	S.D.		
Autonomic group VI (13 cases)						
Systolic blood pressure	132.0	22.0	119.5	19.0	−12.5	2.92*
"Mecholyl fall"	29.7	12.0	24.2	13.0	−5.5	1.94†
"Area"	59.2	35.6	40.4	51.6	−18.8	2.25‡
"Homeostasis time"	24.6	3.9	13.9	8.9	−10.7	4.31§
Autonomic groups I, II, and III (15 cases)						
Systolic blood pressure	120.9	12.1	114.8	10.2	−6.1	1.97†
"Mecholyl fall"	20.4	21.0	20.4	7.8	0.0	—
"Area"	15.6	12.1	22.9	21.1	+7.3	1.63¶
"Homeostasis time"	9.1	5.9	12.7	7.5	+3.6	2.03†

* p. <.02.
† p. <.10.
‡ p. <.05.
§ p. <.00.
¶ p <.01.

Maximum fall in systolic blood pressure following mecholyl. The "mecholyl preoperative fall" was greater for Group VI cases than others. The change in "fall" after operation was almost significant ($p < .10$). The cases with other autonomic patterns showed no change in this measure after operation. The difference in change of the two groups with operation is not significant ($p = < .20$).

"*Area*" was significantly diminished by operation for Group VI cases (p

[1] Older terminology.

<.05), and actually increased for the remaining autonomic types. The difference in effect of operation (table 42) is highly significant (p <.01).

"*Recovery time*" was reduced after operation for Group VI cases in a highly significant sense (p < .001), whereas it was actually increased for the other autonomic types (table 41). The difference in effect of operation upon these two groups is extremely significant (p < .001).

Summary. The changes in these two autonomic groups paralleled the changes described above for improved and unimproved cases. Group VI

TABLE 42

Comparison of changes in physiological variables of specific autonomic groups following frontal lobe surgery

	(1) GROUP VI (13 CASES)		(2) GROUPS I, II, III (15 CASES)		(2) − (1)	t
	Mean change	D.S.	Mean change	S.D.		
Systolic blood pressure	−12.5	13.1	−6.1	11.0	6.4	1.08
"Mecholyl fall"	−5.5	9.9	0.0	8.8	5.5	1.54*
"Area"	−18.8	28.9	+7.3	16.1	26.1	2.76†
"Homeostasis time"	−10.7	8.7	+3.6	6.5	14.3	4.69‡

* p. <.20.
† p. <.02.
‡ p. <.00.

TABLE 43

Clinical outcome of specific autonomic groups following frontal lobe surgery

	IMPROVED CASES	UNIMPROVED CASES	TOTAL
Group VI	9	4	13
Groups I, II, and III	6	9	15
Totals	15	13	28

cases showed a fall of resting blood pressure with operation and a considerable deduction in responsiveness to mecholyl (diminished "fall", "area", and "recovery time"). The other autonomic groups (I, II, and III) show a slight drop in resting blood pressure level and an increased response to mecholyl (increased "area" and "recovery time").

Clinical outcome of autonomic groups following frontal lobe surgery

Table 43 shows that of 13 cases originally classified as Group VI, 9 were improved and 4 unimproved. On the other hand, out of 15 cases classified

originally in autonomic groups *other* than VI, 6 were improved and 9 unimproved. The X^2 value for this distribution is 2.39 with a probability of $p < .20$. The trend is in the expected direction but the difference, perhaps because of too few cases, is not statistically significant.

Changes in physiological variables in relation to type of frontal lobe surgery (table 44)

Resting systolic blood pressure. A drop in systolic blood pressure occurred following each type of operation, but greatest for bimedial, slightly less for bilateral, and least for unilateral operation. Only the difference between bimedial and unilateral lobotomy was significant and that was at the 5 per cent level.

TABLE 44

Changes in physiological variables in relation to types of frontal lobe surgery

	(1) BIMEDIAL			(2) BILATERAL			(3) UNILATERAL			1 – 2	t	1 – 3	t	3 – 2	t
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change						
Systolic blood pressure	125.8	112.0	–13.8	121.0	108.9	–12.1	126.3	125.5	–.8	—		2.81*	‡	—	—
"Mecholyl fall"	26.2	18.0	–8.2	22.0	20.5	–1.5	24.2	23.8	–.4	1.62	†	1.85	‡	—	—
"Area"	34.1	21.2	–12.9	26.9	17.7	–9.2	42.9	43.2	+.3	—		—			
"Homeostasis time"	19.2	12.0	–7.2	14.2	9.5	–4.7	14.1	15.0	+.9	—		1.72	‡	1.47	†

* p. < .05.
† p < 20.
‡ p. < .10.

Maximum systolic blood pressure fall after mecholyl. This fall in blood pressure was reduced after each type of operation; the greatest change occurred in the bimedial cases, less change in the bilateral cases and least change in the unilateral cases. The difference between the bimedial and bilateral cases was only at the 20 per cent level of significance, that between bimedial and unilateral was at the 10 per cent level of significance.

"*Area*". The area was reduced in both bimedial and bilateral cases, more in the former than the latter; in unilateral cases a slight increase was noted. The differences was not significant.

"*Recovery time*". Recovery time was decreased in bimedial and bilateral cases, more so for the former than the latter. In the unilateral cases an actual increase was noted. None of the differences was truly significant.

Summary. All the physiological changes which we have learned to consider as favorable prognostic signs were not marked in the bimedial cases; they were all less marked in the bilateral cases. The unilateral cases showed

the least overall change and changes in the favorable directions were least conspicuous.

The above observations tend to support the hypothesis that the bimedial operation gives the greatest overall physiological change, that the physiological changes are the most favorable of the three operations. This operation may, therefore, be considered as physiologically "correct" for it produces the most favorable physiological changes with the least damage.

DISCUSSION

The overall physiological effect of three different operations upon the frontal lobes in chronic psychotic patients appeared to be an early drop in blood pressure which, though slight, was statistically significant, and a tendency towards return to normal with time. By 4 to 6 months the level was still below the preoperative mark, but approximately one-half way back to normal. The fall in resting blood pressure was greater for improved than unimproved cases, the greatest for bimedial cases.

The overall response to mecholyl was slightly diminished after operation, however numerous variations in direction and in magnitude of change were noted for different patients in the series. Analysis showed that those patients with the marked mecholyl reaction preoperatively shifted definitely towards normal or decreased reactivity after operation, wheras those with slight mecholyl reaction preoperatively shifted little or not at all in the normal direction, or shifted in the opposite direction of *increased* responsiveness. It would also appear that marked mecholyl responsiveness is a favorable prognostic sign whereas slight mecholyl responsiveness is an unfavorable prognostic sign. So far as type of operation was concerned the bimedial cases showed the greatest changes in mecholyl responsiveness, the bilateral next, and the unilateral the least.

These data, taken together, may be construed to indicate that the greater the physiological deviation before operation from the normal, and the greater the physiological shift towards normal following operation, the better the prognosis for the mental illness. The data also suggest a physiological explanation of *why* bimedial lobotomy gives the best results—namely, the *operation is so located that maximum favorable physiological changes are produced.*

The elevation of systolic blood pressure and the marked response to mecholyl found in the group with the favorable prognosis suggests the physiological action of an ordinary epinephrine-like substance, whereas the group with the unfavorable prognosis show physiological characteristics which suggest the action of a non-epinephrine-like substance. This statement is supported by investigations in this laboratory, in which the blood pressure was artificially elevated by ordinary epinephrine and by nor-

epinephrine. In the first case the response to mecholyl was large, whereas in the second case the response to mecholyl was small. Polygraph studies by Ax and Greenblatt (6) also suggest that patients with the ordinary epinephrine reaction-type have the better prognosis following frontal lobe surgery than those with the nor-epinephrine reaction-type.

SUMMARY

1. Frontal lobe surgery was followed by a slight but statistically significant drop in systolic blood pressure at 1 to 3 months post-operatively with return half-way to the preoperative level at 4 to 6 months.

2. Frontal lobe surgery was followed by a slight decrease in the systolic blood pressure reaction to 10 mg. mecholyl intramuscularly at 1 to 3 mon hs and a further decrease at 4 to 6 months.

3. Those patients clinically improved by frontal lobe surgery showed preoperatively a higher resting systolic blood pressure level, and a larger and more sustained drop in blood pressure following mecholyl than those patients who were clinically unimproved by operation.

4. The essential physiological trend for the improved cases was a drop in resting blood pressure, and a decrease in the depth, and duration of blood pressure fall induced by mecholyl. By contrast, the unimproved cases showed less of a drop in resting blood pressure and an increase, rather than a decrease, in the response to mecholyl. The improved cases, therefore, changed towards the normal, the unimproved towards the abnormal type.

5. Patients who received the bimedial operation showed the greatest overall physiological changes after operation, bilateral cases were next, and unilateral cases showed the least physiological changes after operation. The changes of the bimedial and bilateral cases were essentially in the favorable direction, whilst the changes of the unilateral cases were not.

6. The bimedial operation seems to be the most physiologically "correct" of the three types of operation.

7. Synthetic-epinephrine-like substance is thought to characterize the cardiovascular status of the patients who are apt to have a good prognosis with lobotomy, and nor-epinephrine-like substance those patients with a poor prognosis.

REFERENCES

1. Greenblatt, M.: Description of research groups. In preparation for second volume of Boston Psychopathic Hospital Studies in Lobotomy.

2. Funkenstein, D., Greenblatt, M. and Solomon, H. C.: Psychophysiological study of mentally ill patients. I. The status of the peripheral autonomic system as determined by the reaction to epinephrine and mecholyl. Am. J. Psychiat., *106:* 16–28, July, 1949.

3. Funkenstein, D., Greenblatt, M. and Solomon, H. C.: Psychophysiological study of mentally ill patients. II. Changes in reaction to epinephrine and mecholyl after electric shock treatment. Am. J. Psychiat., *106:* 116–121, Aug., 1949.

4. Chapman, W. P., Livingston, R. and Livingston, K. E.: The effect of lobotomy and electrical stimulation of the orbital surface of frontal lobes upon respiration and blood pressure in man. Chapter 16 in Studies in Lobotomy, Ed. by Greenblatt, M., Arnot, R. A. and Solomon, H. C., pp. 350–370, Grune & Stratton, 1950.
5. Funkenstein, D. and Greenblatt, M.: A test which predicts the clinical effects of electric shock treatment of schizophrenic patients. Am. J. Psychiat., *106:* 889–901, June, 1950.
6. Ax, A. F. and Greenblatt, M.: Physiological changes following frontal lobe surgery in chronic mental illness. Presented before the Boston Society of Neurology and Psychiatry, 1950.

CHAPTER XXIX

TREATMENT OF PSYCHOMOTOR STATES BY ANTERIOR TEMPORAL LOBECTOMY

A Report of Progress[1]

PERCIVAL BAILEY, JOHN R. GREEN, LUIS AMADOR AND FREDERIC A. GIBBS

We report herein the results obtained by two teams of investigators who have been attempting to treat psychomotor epilepsy and the psychiatric disorders which are commonly associated with it by means of anterior temporal lobectomy. The investigation began at the Illinois Neuropsychiatric Institute, but the two groups now work independently with only occasional consultation. Their results are here reported together in order to provide a maximum of information on a subject of considerable practical and theoretical interest. Because of the large number of investigators[2] in both groups it was necessary to omit from the list of authors some of those who are most actively participating in the projects.

The relationship between the anterior portion of the temporal lobe and psychomotor epilepsy has been demonstrated in previous reports (1, 2), including the treatment of psychomotor epilepsy by anterior temporal lobectomy (3–5). Psychomotor seizures are trance-like spells or confusional episodes, which were formerly referred to as epileptic equivalents or attacks of epileptic automatism. The clinical symptoms and signs, in addition to the seizure patterns, frequently suggest the presence of pathology in the temporal region. Electroencephalographic investigation discloses a focus of spike discharges in the anterior temporal area in the great majority of patients with such seizures, provided the study is carried out during drowsiness and sleep. Such EEG localization is present in only 30 per cent of the cases in the waking state. Sodium pentothal-induced sleep is equally as effective as normal sleep in the recording of such spike discharges, and is utilized during electrocorticography if surgical intervention is decided upon.

[1] This investigation was supported in part by a research grant from the National Institute of Mental Health of the National Institutes of Health, United States Public Health Service.

[2] If proper credit were to be given in the list of authors, the names of Drs. R. E. H. Duisberg and W. B. McGrath of Phoenix, Arizona, should be included, as well as that of Erna L. Gibbs.

Psychosis and severe personality disorders occur in 50 per cent of patients with psychomotor epilepsy. What is commonly called epilepsy with psychosis, in institutionalized patients, usually turns out to be psychomotor epilepsy, and these patients frequently show clinical or electroencephalographic evidence of temporal lobe disorder. The psychoses and disorders of personality from which these patients suffer are of almost all the types encountered in psychiatric practice. It is possible that there is a higher incidence of certain types of psychiatric disorder in this group than in the general psychiatric population, but, in our experience, almost the entire spectrum of psychiatric disorder is encountered among patients with psychomotor epilepsy. Some of the psychomotor epileptics appear to be schizoid, manic, paranoid, depressed, suicidal, or neurotic. That the psychosis is related to the anterior temporal location of the electroencephalographic spike discharge is indicated by its occurrence in 50 per cent of patients with this type of focus and in only 13 per cent with mid-temporal spike foci, and 5 per cent with frontal lobe spike foci.

Studies with Phenurone have shown that the more-or-less continuous psychiatric symptoms and the episodic epileptic disturbances are physiologically separate and distinct, for psychomotor seizures may be eliminated with the drug and the EEG normalized, and yet the psychiatric disorder may be greatly intensified. However, experience with anterior temporal lobectomies indicates that when the psychomotor seizures are stopped and the electroencephalographic focus excised, the psychiatric disorder may also be eliminated or improved (6).

Sixty-four cases are herein reported; 36 were operated on at the Illinois Neuropsychiatric Institute and 28 were operated on in Phoenix. The first attempt was made in Chicago on July 3, 1947 (operator P. B., assistant, J. R. G.) and the last in Phoenix on August 13, 1951. In the first operations an attempt was made to isolate the focus by local cortical excision. The excision was increased in later operations because of the discovery of remaining spike discharges after operation. Beginning with the sixteenth case at Illinois, and the first case in Phoenix (July 26, 1948), a rather standard operation has been used, removing the pole of the temporal lobe back as far as the lower extremity of the central sulcus (identified by electrical stimulation), the excision extending from the Sylvian fissure to the occipito-temporal sulcus and, in depth, to the hippocampus, uncus, amygdala, and island which are uncovered but not removed unless examination discloses typical spike discharges coming from them. We have never removed the above mentioned structures on both sides nor have we dared to remove the island of the left (dominant) side.

Table 45 shows the relationship between the post-operative electroencephalogram, in the Illinois series, and the therapeutic effect upon the

psychomotor seizures. When the electroencephalogram is greatly improved, i.e., when the focus is reduced or eliminated by the operation, psychomotor seizures are usually reduced or eliminated.

TABLE 45

Unilateral anterior temporal lobectomy; unilateral psychomotor focus

Illinois series: 15 cases

PSYCHOMOTOR SEIZURES	POST-OPERATIVE E.E.G.			
	Worse	Unchanged or slightly improved	Moderately improved	Greatly improved
Seizure free		++		+++++
Moderately improved		++	+	+
Slightly improved or unchanged		+++		
Worse			+	

TABLE 46

Unilateral anterior temporal lobectomy; unilateral psychomotor focus

Phoenix series ..... 18 cases (−)
Illinois series ..... 15 cases (+)
Total ..... 33 cases

PSYCHOMOTOR SEIZURES	PSYCHIATRIC STATE			
	Worse	Slightly improved or unchanged	Moderately improved	Greatly improved
Seizure free		+	-----	----

		−		++++
				++
Moderately improved		+	---	+
			++	
Slightly improved or unchanged		+++		
		−		
Worse		+		

In cases with a unilateral focus operated on unilaterally, if the psychomotor seizures were greatly reduced the psychiatric state tended to be greatly improved (table 46).

Cases with psychomotor seizures which do not respond to anti-convulsant medication, but which have severe psychiatric symptoms, may have bilateral though independent spike foci in the anterior temporal regions. Most

of the operations which have been performed on such cases have been unilateral. When cases with bilateral psychomotor foci are considered it is seen that a unilateral anterior temporal lobectomy is only about one third as

TABLE 47

Unilateral anterior temporal lobectomy; bilateral psychomotor focus

Phoenix series ..... 10 cases (−)
Illinois series ..... 21 cases (+)
Total ..... 31 cases

PSYCHOMOTOR SEIZURES	PSYCHIATRIC STATE			
	Worse	Slightly improved or unchanged	Moderately improved	Greatly improved
Seizure free		−	− − +	− ++
Moderately improved			− − + + + + + + + + +	+ + +
Slightly improved or unchanged		− − − − + + + + + +		
Worse				

TABLE 48

Unilateral operation; unilateral focus

	P.	I.	TOTAL
	%	%	%
A. Seizures stopped	78	47	64
B. Psyc. state gr. imp.	44	46	45
Rehabilitated (A & B)	44	40	42

TABLE 49

Unilateral operation; bilateral focus

	P.	I.	TOTAL
	%	%	%
A. Seizure free	40	15	23
B. Psyc. state gr. imp.	10	24	20
Rehabilitated (A & B)	10	10	10

effective in stopping seizures as when the focus is unilateral (tables 47–49). Twenty-three per cent of the group with the unilateral operation, but a bilateral electroencephalographic focus, remained seizure free, and 20 per

cent were greatly improved psychiatrically. The total per cent rehabilitated dropped to 10.

The present findings confirm the impression that the psychiatric symptoms and the epileptic disorder are closely related anatomically, although pharmacologic studies indicate that they differ physiologically (2). In our experience, when psychomotor seizures are stopped following anterior temporal lobectomy, the psychiatric disorder which so frequently is associated is either reduced or eliminated (3–5).

The decision to institute surgical therapy in patients with psychomotor epilepsy is made only after exhaustive clinical and laboratory analysis of the individual problem. It is not simply a matter of electroencephalographic localization of an anterior temporal spike focus. Although it was electroencephalographic experience that actually correlated psychomotor epilepsy and anterior temporal localization, there are important clinical features of the seizure pattern and a pathologic diagnosis to be considered similar to those applied in selecting patients with other types of focal epilepsy for surgical intervention. These factors, as applied to psychomotor epilepsy, have been described in our early reports (3, 4), and have been emphasized recently (5, 7). Definite evidence of both clinical and laboratory (including electroencephalography) disorder of the anterior temporal region, failure to respond to anti-convulsant medications, and the presence of seizures or a mental state which constitutes a danger to the patient or others, and the probability of the finding of surgical or microscopic pathology in the anterior temporal area are the primary criteria for surgical intervention. Psychiatric abnormalities are no longer considered to be a surgical contraindication—in fact, it appears that anterior temporal lobectomy in these selected cases offers these patients considerable chance of psychiatric improvement, including more mental alertness, conative drive and continuing integration and social adjustment.

In view of the observation that some of the more severe cases of psychomotor epilepsy demonstrate bilateral anterior temporal localization, if the other criteria for surgical intervention are present and if the preponderance of the clinical and laboratory evidence indicates that the disorder is in surgically accessible and removable cortex, a bilateral, two-stage operation may be advisable. Three such procedures have been performed at Illinois and one at Phoenix. One patient has had his seizures greatly reduced and his psychiatric state is moderately improved, but he is still psychotic and institutionalized. Another continues to have frequent seizures, but he is less withdrawn and has a good job at present, whereas previously he was unemployable. Two patients are unchanged; none is worse. Thus, the bilateral operation does not seem to be fraught with the very serious consequences that might have been expected on the basis of similar, but more extensive procedures in monkeys (8).

A pathologic report of the surgical specimens is forthcoming. From the preliminary results it would appear that when a structural lesion is present the chances of obtaining a good therapeutic result are greater than when the only evidence of abnormality within the anterior temporal area is electroencephalographic.

SUMMARY AND CONCLUSIONS

Anterior temporal lobectomies have been performed on sixty-four patients with psychomotor epilepsy. In 28 of these, or 42 per cent, both the psychomotor seizures and the non-ictal psychiatric disorder have been so greatly reduced or eliminated that the patient has been rehabilitated from a state of economic liability. In only one case was the patient made worse. There has been no operative mortality, but two of the patients have died from other causes unrelated to their convulsive disorder or its surgical treatment.

The surgical treatment of psychomotor epilepsy is not empiric, but is directed toward the elimination of an objectively demonstrable and anatomically localizable disorder. The results compare favorably, from the standpoint of rehabilitation of patients, thus far, with the neuro-surgical treatment of cerebral neoplasms and with the majority of psycho-surgical operations.

It must be remembered that any statistical study should deal with comparable data for the results to have meaning. Our data are far from ideal. This study must be regarded, therefore, as only a report of progress. We believe that no appraisal of the surgical treatment of epilepsy will have much validity unless at least five years have elapsed since operation in every case used.

BIBLIOGRAPHY

1. Gibbs, E. L., Gibbs, F. A. and Fuster, B.: Psychomotor epilepsy. Arch. Neurol. & Psychiat., *60:* 331–339, 1948.
2. Gibbs, F. A.: Ictal and non-ictal psychiatric disorders in temporal lobe epilepsy. J. Nerv. & Ment. Dis., *113:* 522–528, 1951.
3. Bailey, Percival and Gibbs, F. A.: The surgical treatment of psychomotor epilepsy. J. A. M. A., *145:* 365–370, 1951.
4. Green, J.R., Duisberg, R. E. H. and McGrath, W. B.: Focal epilepsy of psychomotor type. A preliminary report of observations on effects of surgical therapy. J. Neuro-surg., *8:* 157–172, 1951.
5. Green, J. R., Duisberg, R. E. H. and McGrath, W. B.: Electrocorticography in psychomotor epilepsy. EEG & Clin. Neurophysiol. J., *3:* 293–299, 1951.
6. Gibbs, F. A., Everett, G. M. and Richard, R. K.: Phenurone in epilepsy. Dis. Nerv. Syst., *10:* February, 1949.
7. Green, John R.: Indications for surgical therapy in epilepsy. Ariz. Med., *8:* 24–27, 1951.
8. Bucy, P. C.: The relationship of the temporal lobes to primate behavior. Trans. K. C. Acad. Med., *41:* 223–233, 1939.

CHAPTER XXX

OBSERVATIONS ON MEDIAL TEMPORAL LOBOTOMY AND UNCOTOMY IN THE TREATMENT OF PSYCHOTIC STATES

Preliminary Review of 19 Operative Cases Compared with 60 Frontal Lobotomy and Undercutting Cases

W. B. SCOVILLE, R. H. DUNSMORE, W. T. LIBERSON, C. E. HENRY AND A. PEPE

INTRODUCTION

In a previous report (14) the authors indicated that profound physiologic changes followed stimulation of the uncus in man. The concept of the rhinencephalon, as originally proposed by Papez (19) and applied by others (1, 30, 16), indicates a close functional relationship between the medial temporal lobe and the orbital surface of the frontal lobes. This has been confirmed by anatomical studies (3, 12, 13, 21, 7, 15). These observations, together with previously reported alterations in the behavior of experimental animals following temporal lobe surgery (4, 8, 25), were primarily responsible for the following series of cases in which the medial surface of the temporal lobes were resected in whole or in part in the surgical treatment of psychotic states.

LITERATURE

The authors have carried out fractional undercutting of various areas of the frontal lobe cortex (23) with encouraging results on psychotic states but without evidence of appreciable specificity in these areas. In another article (14), the authors found few physiologic changes following stimulation of frontal lobe areas, including the cingulate and posterior orbital gyri, in contradistinction to stimulation of the uncal area of the medial temporal lobe cortex. Stimulation here in conscious man caused loss of consciousness, prolonged respiratory arrest and if continued, grand mal convulsive seizures. Bucy and Klüver (8), Bard and Mountcastle (4), Walker (28), and Fulton's associates (9) have noted striking personality and conduct changes following surgery to the temporal and posterior orbital region in various animal species. The peculiar psychic phenomena characteristic of psychomotor

epilepsy have been described by Bailey and Gibbs (2), Penfield (20), Walker (27), Guillaume and Mazar (10). They found their site of origin to be anatomically closely related to the medial aspect of the temporal lobe, and have already carried out operative fractional temporal lobe resections in its treatment.

Recently, there has been a beginning shift in interest from the frontal to the temporal lobes in the surgical treatment of mental disease in man. Obrador (18) was the first to carry out bilateral vertical closed anterior temporal lobotomies in schizophrenic patients; there was no resulting improvement. Walker (27) performed amygdaloidectomy and resection of the uncus in four cases of deteriorated schizophrenic patients which resulted in a temporary increased placidity in three patients and no change in the psychoses. Williams and Freeman (29) claim relief from auditory hallucinations in one schizophrenic patient undergoing bilateral amygdaloidectomy reported three months postoperatively.

It thus appears from the literature and the writers' experience that therapeutic benefit in mental disease from all forms of frontal lobe operations has been achieved indirectly through a lessening of anxiety and tension rather than through a change in the content or form of the delusions and psychoses themselves. In all probability, the frontal lobes do not contain the actual mechanisms for breakdown or recovery. It remains to be seen whether the temporal lobes contain such mechanisms. No studies have yet been published of resection of the medial surface of the temporal lobes, or of combined orbital and medial temporal cortices which are so closely connected anatomically.

TYPES OF OPERATIONS

With the above facts in mind, the authors embarked on a project of direct surgical attack on the medial surface of the temporal lobes, both alone and in combination with isolation of the orbital frontal lobes by the "undercutting" technique. A total of 19 medial temporal lobe operations have been performed on schizophrenic patients, 17 at Norwich State Hospital and 2 at the Connecticut State Hospital. These operations have been divided into 3 groups:

1. A resection limited to the uncal, peri-amygdaloid and prepyriform cortex, called "uncotomy".
2. A resection of the entire medial cortex of the temporal lobe including the anterior hippocampus and those nuclei and white matter lying medial to the medial wall of the temporal horn. In 2 cases an additional resection of the entire tips of the temporal lobe was carried out. These operations we have called "medial temporal lobotomy."
3. A combination of medial temporal lobotomy plus isolation of the

orbital surface of the frontal lobe by the cortical undercutting technique. (These we have called "orbito-temporal lobotomy".)

Uncotomy was performed on 5 patients, medial temporal lobotomy on 8 patients, and combined orbito-temporal lobotomy on 6 patients. All operations were done bilaterally. Concomitant electrocorticographic, psychometric, electroencephalographic, and gross physiologic studies have been carried out on those patients sufficiently cooperative, and approximately 50 per cent of the operations were done under local anesthesia under small amounts of demerol and preoperative nembutal.

The therapeutic results in these 19 patients were compared to 15 cases of fractional "undercutting" operations performed on each of 3 surface areas of the frontal lobes and to an additional 15 cases of standard prefrontal lobotomies. The areas selected for undercutting were: 1) the superior convexity, 2) the orbital surface, and 3) the medial and cingulate gyrus surface of the frontal lobes (22).

CASE SELECTION AND EVALUATION

Of necessity, only longstanding, seriously deteriorated schizophrenic patients were subjected to temporal lobe operations. 2 had mental deficiency with epilepsy and psychosis. The other 17 are roughly evenly divided amongst hebephrenic, catatonic and paranoid forms of schizophrenia (table 50). The cases have been followed from 1 to 16 months. Table 50 classifies these cases according to their various categories. Fortunately, each of the 7 operative groups are roughly similar in all categories with the one exception of the duration of follow-up which shows considerable variation inasmuch as certain of the frontal lobe fractional undercutting operations had been completed 1 year previous to the temporal lobe operations. All but 4 cases suffered from schizophrenic psychoses[1] and there are approximately the same number of each type of schizophrenia in the 7 operative groups.

OPERATIVE TECHNIQUE

The technique of selective undercutting of the 3 areas of the frontal lobes has been previously described (23, 24). It is to be noted that in undercutting the orbital surface the plane of dissection is carried posteriorly well back to the anterior clinoids emerging in the chiasmatic cisterns so as to both include Brodman's area 13 and to sever cortical connections to the temporal and hypothalamic areas. Undercutting of the medial surface includes the entire rostral portion of the cingulate gyrus both above and below the corpus callosum. The standard open prefrontal lobotomy follows

[1] If the 4 cases of involutional psychoses, which actually had schizoid manifestations plus deterioration and failure to benefit from extensive shock, are omitted from the list, the statistical results would be unchanged in the orbital undercut cases and would fall from 47 to 33 per cent "significant improvement" in the superior surface undercut group.

TABLE 50

Classification of patients undergoing 7 types of temporal and frontal lobes operations

OPERATIONS	TOTAL CASES	AVG. AGE (YRS.)	SEX	DIAGNOSTIC CATEGORY		DURATION ILLNESS (YRS.)	AVERAGE FOLLOW-UP (MOS.)
Temporal lobe operations							
Uncotomy	5	31	F 5	Schizophrenia		8	13
			M 0	Hebephrenic	2		
				Catatonic	2		
				Paranoid	1		
Medial temporal lobotomy	8	35	F 5	Schizophrenia		12	6
			M 0	Hebephrenic	3		
				Catatonic	1		
				Paranoid	2		
				Unclass.	1		
				Psych. with epilepsy	1		
Combined frontal & temporal operations							
Orbito-temporal lobotomy	6	32	F 6	Schizophrenia		14	5
			M 0	Hebephrenic	2		
				Catatonic	2		
				Unclass.	1		
				Psych. with epilepsy	1		
Frontal lobe operations							
Superior surface undercutting	15	42	F 7	Schizophrenia		13	19
			M 8	Hebephrenic	4		
				Catatonic	5		
				Paranoid	4		
				Involutional	2		
Orbital surface undercutting	15	40	F 9	Schizophrenia		9	8
			M 6	Hebephrenic	4		
				Catatonic	7		
				Paranoid	2		
				Involutional	2		
Medial and cingulate surface undercutting	15	36	F 10	Schizophrenia		11	23
			M 5	Hebephrenic	4		
				Catatonic	5		
				Paranoid	4		
				Unclass.	1		
				Psych. with epilepsy	1		
Standard lobotomy	15	38	F 12	Schizophrenia		9	4
			M 3	Hebephrenic	4		
				Catatonic	2		
				Paranoid	3		
				Unclass.	1		
				Psych. with epilepsy	1		
				Psych. with M.D.	3		
				Involutional	1		

the Lyerly-Poppen technique but with the plane of section extending from a point 3 cm. anterior to the coronal suture down to the sphenoid ridge.

Uncotomy

Bilateral approach to the uncal area has been previously described and if certain technical niceties are carried out adequate exposure of the uncus, circle of Willis, 3rd nerves, peduncles and even posterior cerebral arteries can be obtained (see figs. 29 and 30).

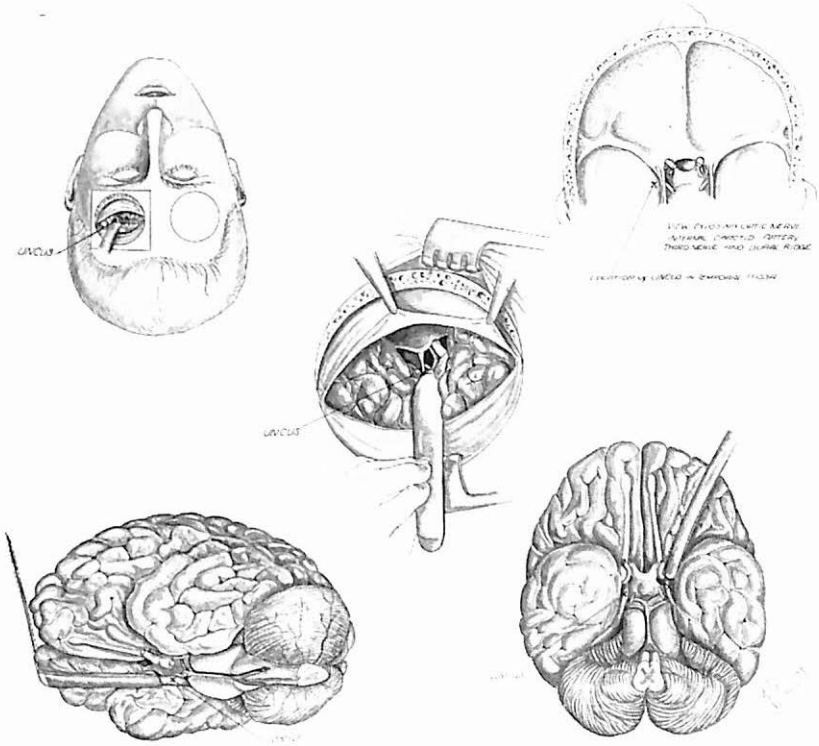


Fig. 29. Sketch of undersurface of brain to show uncal area.

Through bilateral $1\frac{1}{2}''$ supra-orbital trephinations the uncal areas are exposed. Experience has shown that this exposure is made easier by tearing the arachnoid along the middle cerebral artery and lateral edge of the optic chiasm, thus permitting elevation of the posterior orbital face of the temporal lobe (see fig. 30). The uncal area is then resected subpially by a fine suction tip to which is attached the electrosurgical coagulating wire, over an area measuring approximately 3 cm. sagitally, 2 cm. vertically, and 1.5 cm. in depth, thus including the uncal or has shown that this exposure is made easier by tearing the arachnoid along the middle cerebral artery and lateral edge of the optic chiasm, thus permitting elevation of the posterior orbital cortex and lateral retraction of the tips of the temporal lobes. This retraction can be done with a single, very narrow, 1 cm. wide flat brain spatula, exposing the slight bulge of the uncus which is situated exactly lateral to the 3rd nerve just before it enters the dural ridge. It lies approximately 3 cm. posterior to the tip of the temporal lobe and in the superior edge of the medial

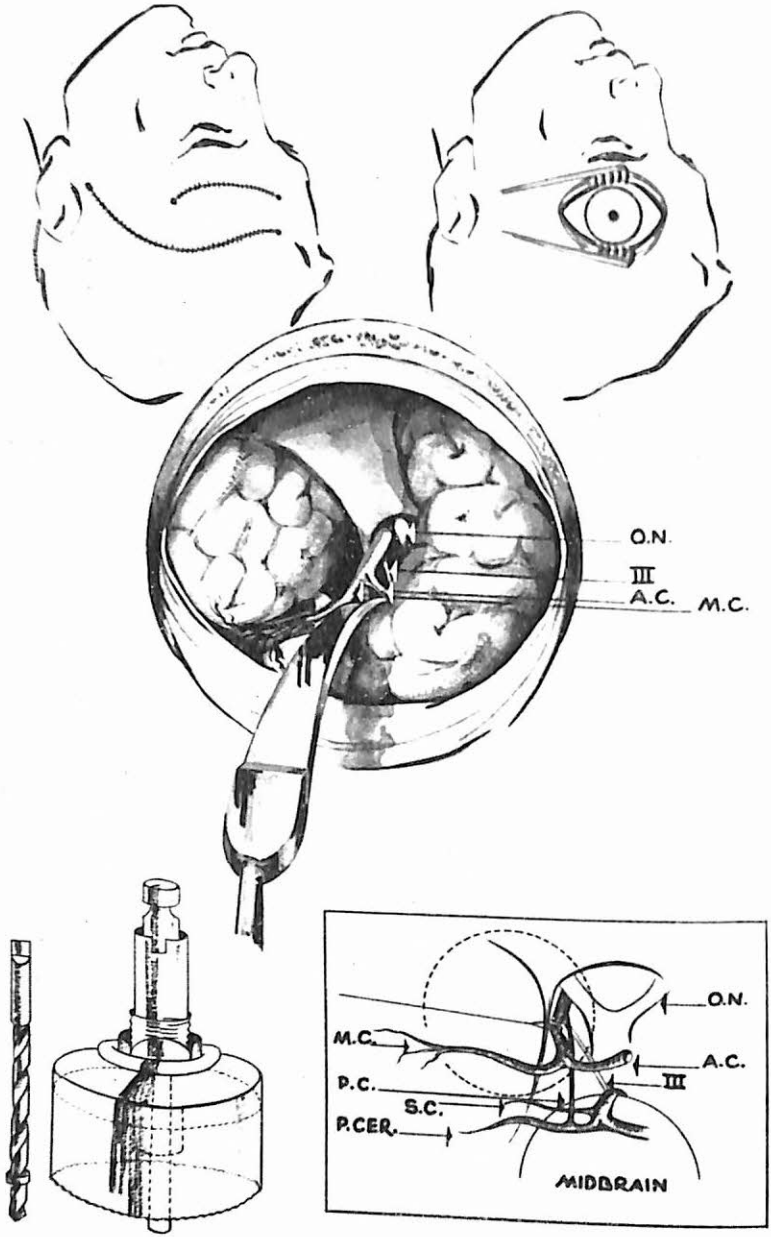


Fig. 30. Sketch of operative approach to uncus.

periamygdaloid cortex, the prepyriform cortex and most of the amygdaloid nucleus which lies some 5 mm. deep to the surface of the uncus and causes the visible bulge which serves to identify the uncus. It is not necessary to use the electrosurgical unit except in separation of small bridging veins along the anterior medial temporal lobe and the anterior clinoids.

Medial temporal lobotomy

This operation includes a far more extensive resection through the same operative exposure (fig. 31).

After exposing both the tip and medial surface of the temporal lobes, a cortical incision is made just anterior to the middle cerebral vessels under the midpoint of the sphenoid ridge so

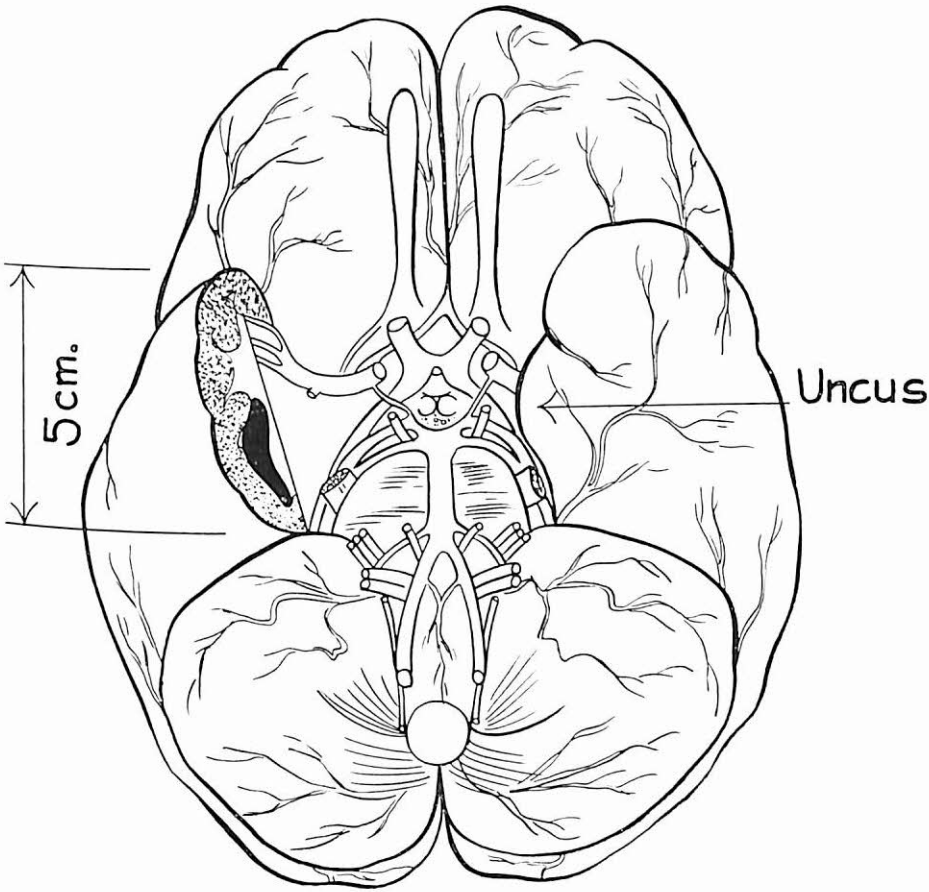


Fig. 31. Sketch of resected area in medial temporal lobotomy. Black area represents the temporal horn.

as to bisect the tips of the temporal lobes. It is necessary to retract the middle cerebral vessels both posteriorly and superiorly with the narrow flat spatula and then to remove fractionally by fine suction the entire medial tips of the temporal lobes. It is not necessary to coagulate vessels with the exception of an occasional small subpial vein on the floor of the temporal fossa. After resecting the medial tips of the lobes, it is necessary to elevate the middle cerebral vessels even higher and remove subpially by suction the grey and white matter situated medial to the temporal horns. This includes the amygdaloid nucleus, periamygdaloid cortex and anterior portion of the hippocampus. The resection is carried 5 cm. posteriorly from the tips of the temporal

lobes, and 3 cm. from the tips of the temporal horns which lie approximately level with the 3rd nerve exit into its dural ridge. The resection includes the medial wall of the anterior 3 cm. of the temporal horns and exposes the choroid plexus within the horns. It extends vertically down to the floor of the temporal fossa and superiorly to the upper limits of the lobe. Posteriorly, the resection emerges in the subpial space approximately level with the *posterior* surface of the peduncles and posterior edge of the petrous ridge. The medial landmarks from front backwards are the anterior clinoid, the carotid artery, the 3rd nerve and optic tracts, the peduncle and posterior cerebral artery. These structures are protected by keeping subpially thruout the fractional suction resection, but it is necessary to continually insert the very narrow spatula extrapially and visualize the peduncles and optic tracts as one progresses in order to prevent penetrating the pia and damaging these structures. It is to be noted that the peduncles constitute both the medial and superior boundaries of the posterior medial surface of the temporal lobes.

In 2 of the 8 cases (G.M. and B.S.), an additional resection of the entire tips of the temporal lobes back to the level of the middle cerebral vessels was carried out. Because of the limitation of space and the necessity for fractional removal by suction, it has so far been impossible to remove the medial grey and white matter en bloc for microscopic study. Direct inspection reveals a definite removal of the uncus (periamygdaloid cortex), prepyriform cortex, medial tips of the temporal lobes and the anterior portion of the hippocampus for a distance of 3 cm. posterior to the tips of the temporal horns. When this area of resection has been carried out en bloc on a cadaver by sharp dissection, the total amount of tissue ablated from each side weighed 12.5 gm., and its delimitations were as described above.

Orbito-temporal lobotomy

This procedure includes the above operation plus bilateral undercutting of the entire orbital cortex of the frontal lobes (fig. 32).

CASE REPORTS

Brief case reports are given here of the 19 cases undergoing one of three types of temporal lobotomy.

Uncotomy

Case 302. D. M., a 28-year-old female at Connecticut State Hospital, ill 10 years, mixed paranoid, hebephrenic, homosexual schizophrenic, actively hallucinating. Bilateral uncotomy August 31, 1950. Result: no improvement nor change until October 1951 when under intensive psychotherapy and electric shock she showed slight improvement. Rating: 0 to 1 plus.

Case 189. I. S., a 48-year-old female, paranoid schizophrenic, ill over 20 years, suicidal attempts. Bilateral uncotomy 11/16/50 with severe damage to midbrain from electrocautery, causing patient to give a most violent jerk on the operating table and immediately lose consciousness, developing decerebrate rigidity during the remainder of the operative procedure with extensor spasm and stupor continuing for some 8 hours postoperatively; spasticity slowly cleared after 1 week being replaced by contractures in flexion, painful joints, and edema of legs; vegetative and withrawn existence lying motionless for some 2 weeks postop.; hyperac-

tive deep reflexes without Babinski and normal vital signs; mental status temporarily worse with apathy, hallucinations, depression; treated with traction and physical rehabilitation with final progressive improvement beginning at 1 month, becoming markedly improved within 3 months, ultimately showing the best result of all operated cases, being discharged to her home 5 months postop. Rating: 4 plus.

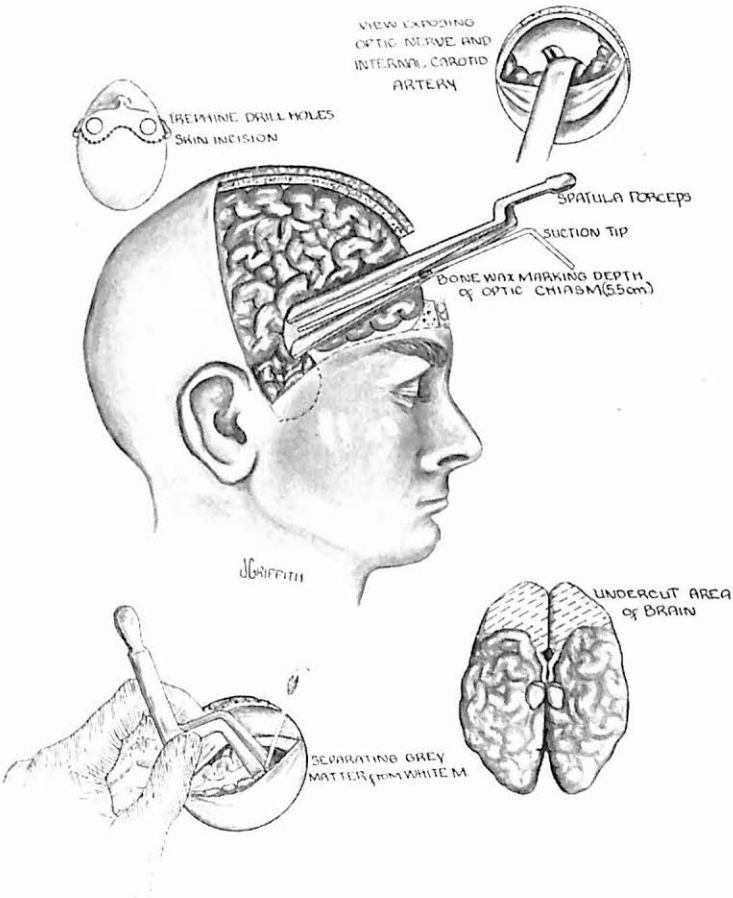


Fig. 32. Sketch of orbital undercutting operation.

Case 188. E. M., a 27-year-old female catatonic schizophrenic, hospitalized for 4 years with temporary improvement after shock therapy, lacking in initiative and activity, auditory hallucinations, impaired judgment. Bilateral uncotomy 11/16/50 under local anesthesia with good cooperation; no loss of consciousness; temporary ptosis, dilated fixed pupil and lateral strabismus of right eye clearing over 3 months; fairly marked early apathy; hallucinations continued postoperatively. Final result: less worried but less spontaneity. Rating: 1 plus.

Case 187. B. P., a 25-year-old catatonic schizophrenic woman, hospitalized $2\frac{1}{2}$ years, religious delusions, excessive masturbation; temporary improvement with shock; homosexual trends; bilateral uncotomy 11/16/50; operation largely under local; stuporous during uncus

resection but responding immediately postop.; early vomiting; temporary incontinence; early result: withdrawal showing no interest in her surroundings. Final result: quieter, otherwise unchanged. Rating: 0.

Case 186. M. D., a 25-year-old catatonic schizophrenic woman, hospitalized 4 years; impulsive, assaultive, occasionally mute, actively hallucinating; bilateral uncotomy 11/16/50; responded immediately postop. with variable pulse and early vomiting; restless but seclusive and irritable. Final result: continues to actively hallucinate. Rating: 0. (Figs. 33 and 34)

Medial temporal lobotomy

Case 192. V. M., a 28-year-old hebephrenic schizophrenic woman hospitalized since 1946, unimproved on shock therapy; destructive, assaultive, noisy with auditory hallucinations.

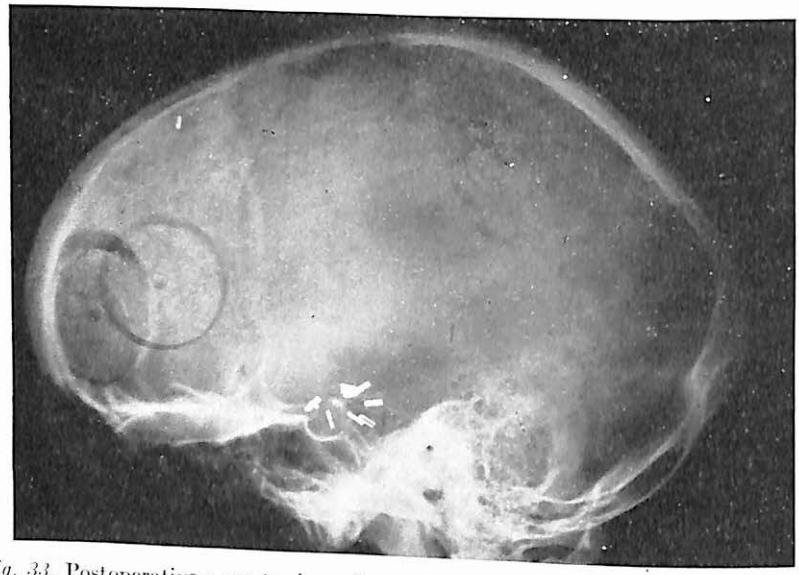


Fig. 33. Postoperative x-ray to show silver clips outlining area of resection in uncotomy, lateral view.

Bilateral medial temporal lobotomy 12/14/50 under pentothal, semi-conscious at end, cyanotic tinge postop., early vomiting; restless, early overactivity, actively hallucinating, hunched posture, quick movements but generally mute, wished to be left alone. Final result: more childish, more active with self-mutilation, continues to actively hallucinate. Rating: 0 to 1 plus.

Case 190. G. V. M., a 53-year-old hebephrenic, schizophrenic woman, ill for 25 years, temporary improvement on shock; deteriorated, untidy, assaultive, impulsive. Bilateral medial temporal lobotomy 12/14/50, including a lobectomy of the anterior tips of the temporal lobes under local anesthesia; temporary right ptosis clearing in months, temporary cyanosis of legs, temporary marked emotional regression with baby talk, cheerful, no longer assaultive. Final result: quieter, appears aged, still actively hallucinating. Rating: 1 plus.

Case 232. B. B., a 34-year-old paranoid, schizophrenic woman, present hospitalization 3 years; previously seclusive, disinterested, assaultive; 120 shock treatments; medial temporal

lobotomy under pentothal 9/27/51. Result: distinct improvement, more active, responsive and outgoing but still hallucinating, no longer assaultive and is cooperative. Final rating: 2 to 3 plus.

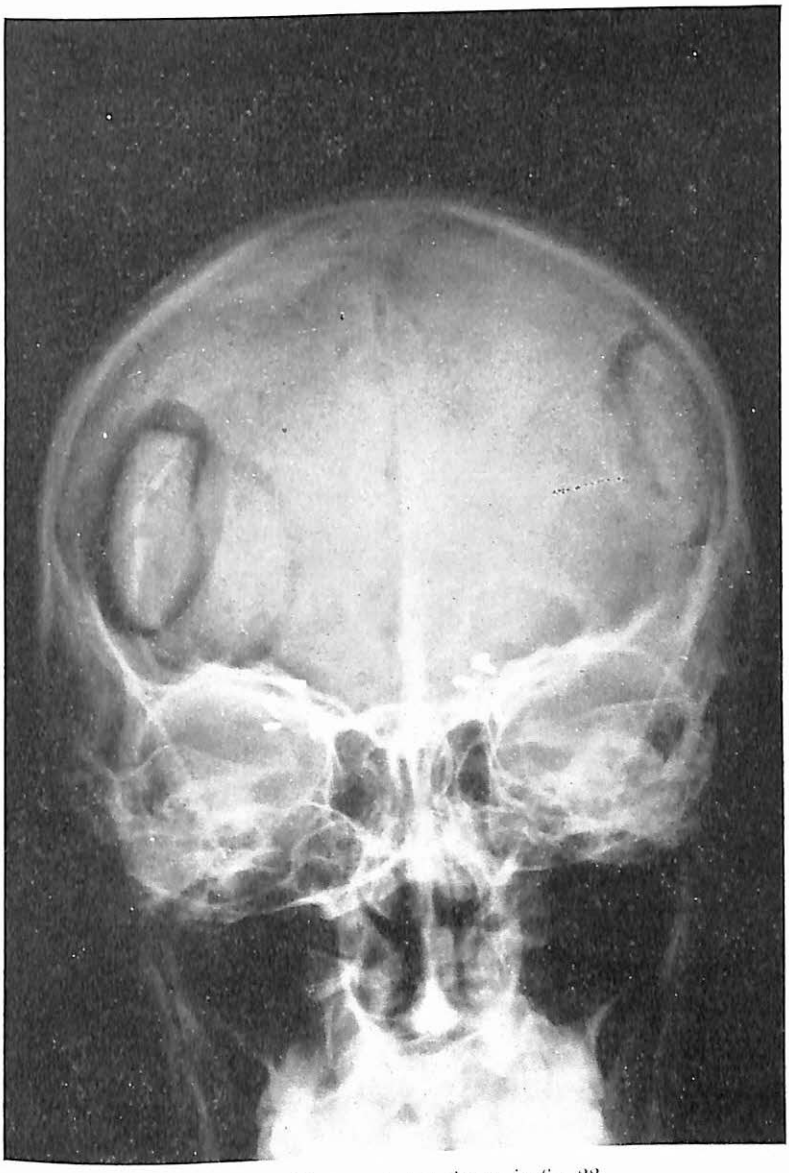


Fig. 34. A-P view of case shown in fig. 33.

Case 193. E. S., a 38-year-old mental defective with psychosis and long-standing grand mal epilepsy present over the previous 22 years; repeated status epilepticus, not controlled by dilantin grs. 4½, phenobarbital grs. 4½ per day; impulsive, assaultive, resistive, mutters, huddles in fetal position in a chair. Bilateral medial temporal lobotomy including lobectomy

of the anterior tips of the temporal lobes 12/14/50; early faint cyanosis and vomiting; 7 seizures first month postop.; thereafter steadily improving in seizure number and severity; much less severe on same medication; 20 severe seizures charted as occurring during year preoperatively with occasional status epilepticus, 5 mild ones during 11 months after first month postop. Final result: no longer requires seclusion all of the time and slightly less assaultive. Final rating: 1 plus.

Case 192. V. M., a 28-year-old hebephrenic, schizophrenic woman, present hospitalization 5 years, hallucinating, some catatonic traits as well, destructive and assaultive requiring packs and seclusion, noisy. Bilateral medial temporal lobotomy 12/14/50 under pentothal with early slight cyanosis postoperatively. Early result: more childish, temporary emotional regression.

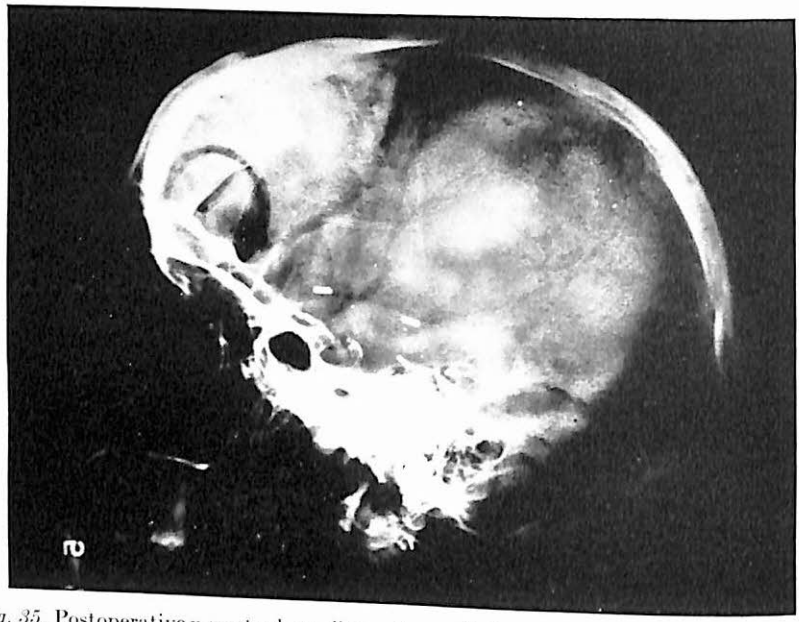


Fig. 35. Postoperative x-ray to show silver clips outlining resection of medial temporal lobe, lateral view.

Final result: no longer assaultive, continues actively hallucinating, but general conduct and mental status are worse. Final rating: minus 1.

Case 242. C. G., a 41-year-old unclassified schizophrenic woman, in institutions for 20 years. Radical bilateral medial temporal lobotomy 11/19/51 under local anesthesia; temporary loss of consciousness during resection; fully conscious at end of operation; no physiologic sequelae. Early result: continues to hallucinate, amorous, more emotional, cries without reason, less confusion, wishes to be left alone, noisy at night. Early rating: slight to moderate improvement. Final rating: 1 plus.

Case 244. A. G., a 24-year-old hebephrenic schizophrenic woman ill for 7 years, hospitalization for 4 years; radical bilateral medial temporal lobotomy 11/19/51 under local anesthesia; loss of consciousness during resection of second side; immediate return of consciousness at end of procedure; early vomiting. Early result: Continues to be overactive, assaultive, resistive

and noisy; will not allow women to come near her. Personality change: now has press of speech, misidentification, flight of ideas. Rating: 0.

Case 321. A. Z., a 30-year-old paranoid schizophrenic woman with 3 years of hospitalization at Connecticut State Hospital temporarily helped by extensive shock therapy; good preservation of personality, tense, assaultive, tidy, impulsive; misidentifies; no definite hallucinations;

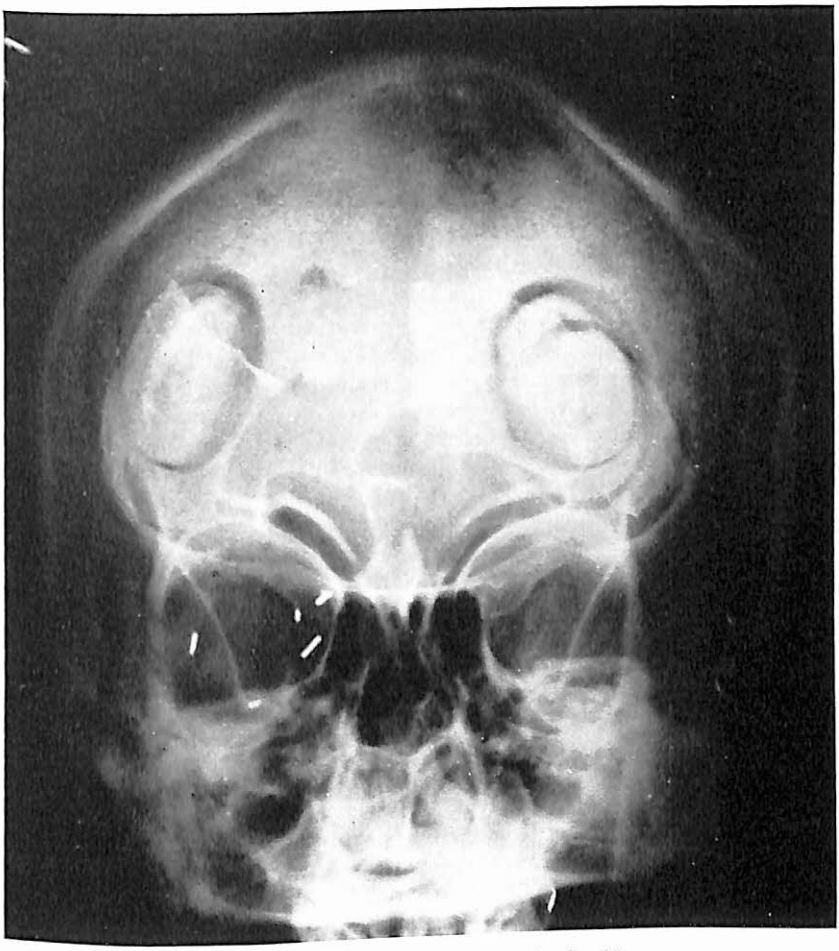


Fig. 36. A-P view of case shown in fig. 35.

preoccupied with sex thoughts, sex threats and paranoid delusions. Medial temporal lobotomy 11/29/51 under local anesthesia; during subpial resection of right hippocampal cortex with patient conscious, one of the authors (W. B. S.) inadvertently went through the arachnoid and injured by suction a portion of the right peduncle, geniculate or hypothalamic region with immediate development of deep coma. The injury was visualized by extra-arachnoid inspection. Postoperatively patient remained in stupor for 72 hours and exhibited a left spastic hemiplegia, contracted fixed pupils, strabismus, lateral nystagmus of right eye; vital signs remained constant and within normal limits. She slowly recovered the use of her left arm and leg

by the end of 3 days with loss of spasticity and a return of urinary continence; continuing lethargy for 1 week. By the 7th day she could walk without support and her eye movements and pupils had recovered with no neurologic residuae except a right homonymous hemianopsia. Of interest is a concomitant dramatic improvement in her psychotic state with what appears to be an early complete remission in her delusions, anxiety, and paranoid trends with forgetting of her previous misidentifications. Rating: 4+. (Figs. 35 and 36)

Orbito-temporal lobotomy

Case 222. A. R., a 35-year-old hebephrenic, schizophrenic woman, present hospitalization since 1946, noisy, suspicious, negativistic, uncooperative, disagreeable; temporarily improved on shock, felt people were going to murder her, assaultive. Bilateral orbito-temporal lobotomy 5/31/51; temporary loss of consciousness during operation under local; early vomiting. Late result: more cooperative, quieter, worried about children, no longer assaultive. Final rating: 2 plus.

Case 221. G. D., a 31-year-old mental defective with psychosis and grand mal epilepsy present since childhood; disagreeable, assaultive, destructive, requiring packs and seclusion. On dilantin 6 grs. and phenobarbital 1½ grs. per day; bilateral orbito-temporal lobotomy done 5/31/51 including an extra amount of white matter in the right orbital undercutting, making it more radical than intended, temporary loss of consciousness during operation, prolonged stimulation studies, 13 consecutive fits postoperatively due to stimulation but it is of interest that since then she has had *no* recorded convulsions over a six months' follow-up except for 4 seizures occurring in quick succession mid-September 1951 when her medication had inadvertently been stopped for the preceding week. Preoperatively, her seizures were intractable and severe. Less press of speech, continues to have auditory hallucinations but otherwise much improved. Final result: marked improvement in both psychosis and convulsions. Rating: 3 plus.

Case 200. R. B., a 34-year-old paranoid schizophrenic woman, ill for 5 years, suicidal, delusions of persecution, tearing her clothes, temporary improvement on shock; bilateral orbito-temporal lobotomy 5/17/51 with temporary loss of consciousness immediately after operation; slow continuing improvement; no incontinence; continuing auditory hallucinations. Final result: 2 plus.

Case 219. D. B., 38-year-old hebephrenic schizophrenic woman ill for 20 years; untidy; tearing clothing, dull, apathetic, hallucinating, no benefit from shock. Bilateral orbito-temporal lobotomy with prolonged uncal stimulation studies; 12 immediate postoperative seizures. Final result: continuing auditory hallucinations, more tidy and slightly improved. Rating: 1 plus.

Case 218. M. J. S., a 29-year-old catatonic schizophrenic woman ill for 14 years, withdrawn, seclusive, hallucinations, apathetic but occasionally assaultive, temporary improvement with shock. Bilateral orbito-temporal lobotomy 5/17/51 with loss of consciousness during resection of uncus under local anesthesia; early vomiting. Final result: occasionally preoccupied, no overt hallucinations and generally shows moderate improvement. Rating: 2 plus.

Case 243. A. D., a 22 year-old catatonic schizophrenic woman with 2 years' illness. Bilateral orbito-temporal lobotomy 11/19/51. Initial drowsiness, untidy, catatonic posturing, mute, hunched posture followed by slow improvement with relevant speech and "looks brighter", likes to be left alone, some continuing posturing. Definite improvement. Rating: 2 plus.

RESULTS

Operative

Nineteen temporal lobe operations have been carried out with no deaths, hemorrhages or infections.

The operative and early postoperative course has been similar to the various frontal lobe operations provided stimulation studies have not been done on the uncal area. When done, prolonged stupor, vomiting and status epilepticus have been common. Excessive manipulation of the uncal area caused vomiting as did excessive cingulate gyrus manipulation. The anesthetist commented on a faint cyanotic tinge as being a common occurrence immediately postoperative. The patients did not rally as quickly as after standard frontal lobotomies. With these minor exceptions the operative and postoperative course was similar to the various frontal lobotomy operations.

Neurologic changes

There have been 2 minor and 2 major neurologic complications, all fortunately largely clearing. All neurologic changes resulted from errors in technique or damage to adjacent midline structures. There was apparently none resulting from resection of the medial temporal lobe itself.

One patient (I. S., uncotomy) showed severe decerebrate rigidity and prolonged loss of consciousness, spasticity and contractures coming on instantaneously after inadvertent touching of the right peduncle with high tension current. There was slow but complete recovery within 3 months. Another patient (A. Z., medial temporal lobotomy) suffered visible suction damage to the region of her right peduncle and geniculate area with immediate loss of consciousness and pinpoint pupils followed by left hemiparesis, left homonymous hemianopsia and questionable left temporary sensory impairment. All slowly cleared, with the exception of the hemianopsia, over the ensuing week. Three patients have had temporary partial selective weakness of a 3rd nerve, all disappearing over the ensuing months except for residual minimal lid droop in one patient and pupillary inequality in one patient. Visual fields by confrontation tests and in a few cases tangent screen tests have failed to show defects. Hearing has been unaffected in all cases. Olfaction tests have been constantly normal. There has been no evidence of aphasia or of pyramidal tract disorder with the above one exception.

Psychiatric

Psychiatric results are shown in table 51 under 2 categories of 1) number of patients showing "significant improvement" and 2) a summation of ratings indicating the amount of improvement shown by all patients in

each operative category. This latter was used because of the small number of cases subjected to statistical scrutiny. A statistical comparison has then been made between the 3 groups of temporal lobotomies and the 4 groups of frontal lobotomies and undercuttings.

In accordance with the standards set up by the Connecticut Cooperative Lobotomy Committee (17), independent opinions were rendered by the ward physician, charge nurse, supervisor, ward attendant, attending surgeon and relatives when possible, as to whether the patient was worse (minus 1), slightly improved (plus 1), moderately improved (plus 2), markedly

TABLE 51

Psychiatric results of 3 types of medial temporal lobotomy compared with 3 types of fractional and 1 of complete frontal lobotomies

TYPES OF OPERATION	NO. OF CASES	NO. OF PATIENTS SHOWING SIGNIFICANT IMPROVEMENT	DEGREE OF IMPROVEMENT (BASED ON A MAXIMUM OF 100)
Temporal lobe operations			
Uncotomy	4*	0 (0%)	6
Medial temporal lobotomy	7*	1 (14%)	16
Combined frontal & temporal operations			
Orbito-temporal lobotomy	6	5 (83%)	50
Frontal lobe operations			
Superior surface undercutting	15	7 (47%)	47
Orbital surface undercutting	15	7 (47%)	32
Medial and cingulate surface undercutting	15	8 (53%)	36
Standard lobotomy	15	7 (47%)	35

* 1 each omitted from uncotomy and medial temporal lobotomy because of receiving additional midbrain damage. These 2 cases each showed marked improvement (3 plus and 4 plus) and if included would result in the figures 1 (20%) and 25 under uncotomy, and 2 (28%) and 23 under medial temporal lobotomy.

improved (plus 3), markedly improved with discharge to home (plus 4). An average of the ratings obtained from all observers was then recorded and charted in 2 columns in such a manner as to show: (1st column) the number and percentage showing "significant improvement" included only those patients moderately improved, markedly improved or home (grs. plus 2, plus 3 or plus 4); (2nd column) the summation of ratings (minus 1 up to plus 4) received by all patients corrected to equal a maximum of 100 in each operative category. For example, the combined individual ratings of the 6 patients in the category of orbito temporal lobotomy was 12 out of a possible maximum of 24, this maximum being the sum of the ratings of 4 plus for each of the 6 patients, which is then corrected to read 100 making the sum total of ratings received in this category corrected to equal 50.

The early results in patients subjected to temporal lobe surgery have been disappointing, especially in contrast to those patients undergoing fractional or complete lobotomy on the frontal lobes. There appears to be a distinct

correlation between the improvement and the quantity of cortex surgically removed (see results in uncotomy, medial temporal lobotomy and combined orbito-temporal lobotomy, respectively). As in frontal lobe surgery, there appears little specificity in the overall effect on psychoses. As one would expect, medial temporal lobe surgery causes little if any blunting in *personality* which is similar to the results obtained in orbital undercutting of the frontal lobes.

Uncotomy. Four out of 5 patients have shown no "significant improvement" and a very low amount of recovery which represents the lowest figures obtained in any of the frontal or temporal lobe operations. The 1 paranoid schizophrenic patient (I. S.) showing significant improvement received in addition severe damage to her midbrain, hence cannot be classified as a pure uncotomy. This case has shown the most remarkable improvement of all cases, being discharged to her home on the 5th postoperative month.

Medial temporal lobotomy. Six out of 8 cases have shown no "significant improvement" and a relatively low amount of recovery. Only one patient (B. B.) with a pure medial temporal lobotomy has shown moderate improvement, and she continues to hallucinate. The other patient (A. Z.) showing marked improvement received additional severe damage to her midbrain putting her in the same special category as the exceptional case of uncotomy. Although followed for only 1 month, she too has exhibited an immediate and marked remission of her psychotic trends and delusions as well as in her anxiety and tension. Her family is delighted and her early results are excellent. Emotionally, she showed apathy for 2 weeks which then cleared and a continuing retrograde amnesia for her entire psychosis (of 3 years' duration).

Orbito-temporal lobotomy. In contradistinction to the operations limited purely to the temporal lobes, the more extensive operation of combined medial temporal lobe resection and orbital undercutting showed significant improvement and a high relative amount of recovery in all but 2 cases. This combined operation yielded both a greater number and greater amounts of improvement than either frontal or temporal operations alone, again suggesting a quantitative rather than qualitative effect.

Frontal lobe operations. Results in these 3 small series of fractional undercutting operations and 1 small series of complete standard lobotomy yielded results similar to those reported previously in a larger series and almost identically similar one to the other, suggesting that a "complete" frontal lobotomy interrupts more tissue than is necessary to obtain psychiatric improvement but that it makes little difference which area one selects from the frontal lobes for a fractional lobotomy in order to obtain comparable psychiatric results.

Results on behavior. Previous literature has described certain changes in

behavior in both animal and man following temporal lobe surgery. Hence, particular attention has been paid to the following categories:

Regression: 8 out of 19 patients have shown some degree of early and temporary regression representing chiefly an exaggeration of a previously existing tendency. Two patients (G. M. and D. M.) have shown an extreme childish regression with baby talk and simpering ways for weeks to months following operation. Two have been markedly apathetic; three showed an exaggeration of a previous catatonic withdrawal.

Passivity vs. overactivity: There has been no consistency in this category. Three patients were restless, 2 of them with pacing reaction; the remainder showed an irritable apathy in the early postoperative stage, remaining motionless except when molested; 6 out of 19 have shown placidity rather than irritability.

Hallucinations: The authors can state with certainty that there is no appreciable change in auditory or visual hallucinations in the early stages after operation. Fourteen out of nineteen patients had definite preoperative hallucinatory experiences, usually in the auditory sphere. Postoperatively, 11 of the 19 are visibly hallucinating which is comparable to the results in standard lobotomy (6); in no case has it been possible to demonstrate a different type of hallucinatory experience.

Sexual behavior: There has been no obvious increased sexuality in 17 of the 19 patients; one patient showed a childish, silly, amorous approach to hospital personnel for the first 3 months postoperatively, and another showed an increased masturbatory activity for 1 month.

Mood: There has been no rage reaction, and the mood has varied between apathy and irritability; none have showed euphoria; there has been less early relief from tension than in frontal lobe fractional procedures.

Physiologic

Resection of medial temporal lobe cortex and underlying white matter has no gross effect on pulse, blood pressure or state of consciousness, certainly no more than has been shown in various fractional frontal lobe operations. This is in marked contrast to the profound physiologic changes resulting from electrical stimulation of the uncus as described in a previous report. The only gross changes noted were: loss of consciousness during the manipulation and resection of the uncal area but clearing by the end of the procedure, and the vomiting and minimal cyanosis previously described.

Stimulation and electricocortigraphy (ECG)

Electrical stimulation and recordings have been previously described (11, 14) and extended during this present series. Fig. 37. Under resting condition, the uncal region shows a low amplitude, poorly organized activity as compared to the well defined fast rhythms recorded from the orbital and superior surfaces of the frontal lobes. This in in contradistinction to the well defined alpha activity described in the literature as occurring over the outside surface of the temporal lobes. Even low amplitude stimulation to the uncus causes a marked amount of afterdischarge. The duration of this afterdischarge is directly proportional to the voltage of stimulating current which has been of the square wave type of 10 millisec. pulse duration, 50

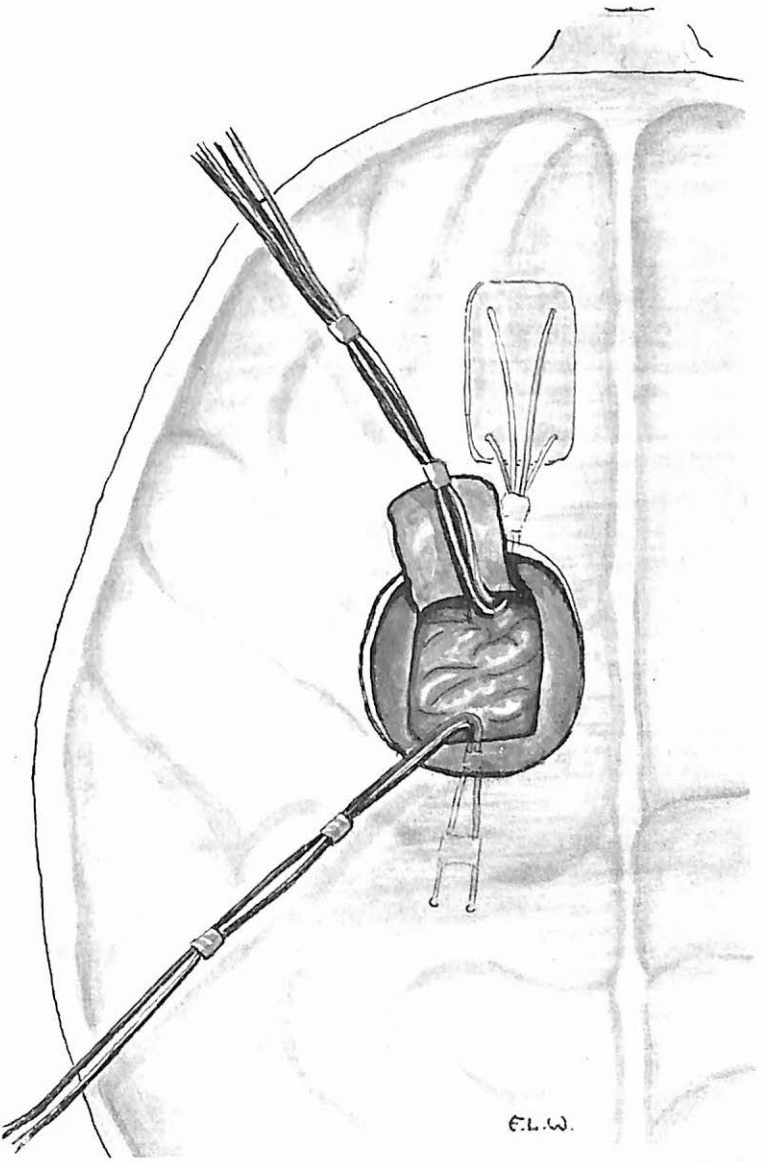


Fig. 37. Sketch showing 2 types of postage stamp electrodes used for combined recordings and stimulation of the uncus and frontal cortices. (From Digest Neurol. Psychiat., *17:* 670–680, 1949.)

per sec. frequency, and stimulus duration of 5 to 10 sec. The afterdischarge almost equaled that occurring from the premotor cortex and far surpassed that occurring from orbital or superior frontal surfaces. The afterdischarges spread to the contralateral uncus and to either or both orbital surfaces but

not to the superior frontal lobe surface. Such spread occurred with near threshold stimulation.

Seizures and EEG's

Two out of 19 cases (G. D. orbito-temporal and E. S. medial temporal) had mental deficiency with psychosis and epilepsy throughout the previous 20 years. Adequate medication had failed to prevent seizures and both had had bouts of status epilepticus. Both had immediate seizures on leaving the operating table following temporal lobe surgery, but both have shown improvement over their preoperative status continuing to date 7 and 11 months respectively. G. D. has had no seizures since the day after operation with the exception of a bout of 5 seizures when her medication was inadvertently stopped for 1 week. E. S. has shown moderate improvement in the number, and marked improvement in the severity of her postoperative seizures, exhibiting 7 seizures during the first month postop, 5 during the ensuing 11 months as compared to 20 during the preoperative 12 months. Both have continued on their preoperative medication.

Immediate severe postoperative seizures followed the midbrain damage sustained by the 2 patients I. S. and A. Z. with none thereafter. In the other 15 cases undergoing temporal lobe surgery, there has been only 1 seizure (G. V. M.) occurring more than 6 hours after operation, and this took place 11 months after operation. Bilateral resection of the tips of the temporal lobes as well as medial temporal lobotomy was done on this patient. Excepting the 2 epileptic patients, none of the patients have received prophylactic anti-convulsive medication postoperatively.

EEG's were attempted on all patients before and after operation at the EEG laboratory at the Norwich State Hospital, under the supervision of Dr. Charles Krinsky, who has kindly permitted the authors to analyze the graphs in certain cases of interest. The observed changes in the EEG's of patients undergoing temporal lobe surgery were generally no different from those found in other types of frontal lobotomy. The 2 epileptic patients showed: G. D., who has exhibited marked improvement in her seizures postoperatively, had a preoperative EEG of 4 to 5 per sec. activity originating in both temporal lobes without definite unilateral predominance and increased by hyperventilation. EEG's at 1½ and 4 months after operation showed a replacement of the above by low delta amplitude activity in the frontal lobes. E. S., who has had a moderate improvement in her seizure formation since operation, had a preoperative EEG exhibiting diffuse abnormality with 4 per sec. activity over the entire brain without specific epileptogenic pattern or unilaterality, and at times poorly organized 3.5 per sec. delta activity. One year after lobotomy her EEG showed a remarkable decrease of slow activity with some fast activity in the occipital region (13 to 14 per sec.) and organized fast activity (12 to 13 per sec.) in the frontal lobes. There were no delta waves.

DISCUSSION AND COMMENT

Many observations of secondary interest have resulted from this study. The question of primary interest as to whether medial temporal lobe surgery will benefit psychotic patients more than frontal lobe surgery cannot yet be answered definitively. The early results are not impressive nor are there indications to date of the temporal lobes containing any specific mechanisms for the fundamental altering of schizophrenic psychoses. As in the frontal lobes, there does not appear to be any specificity of effect on mental disease, contained within the medial temporal lobes. It is of interest to note the two cases exhibiting the most marked relief from psychotic symptoms were the 2 patients inadvertently receiving severe damage to deep midline structures, i.e. midbrain, geniculate or hypothalamic regions.

This proved to be the case in a 3rd patient previously reported (23) undergoing an orbital undercutting with an extensive postoperative hematoma under the frontal ventricular horns extending backwards against the 3rd ventricle. This patient exhibited profound physiologic disturbances followed by a slow and complete remission of his psychosis. In recounting these fortunate misfortunes to others, the author was told of another patient suffering apparent damage to deeper central structures when she was given an extreme hyperthermia (beyond the limits of the thermometer) lasting 24 hours, followed by prolonged *decerebrate rigidity*, due to overheating from a broken thermostat in her continuous bath. She too underwent a remarkable remission of all psychotic trends.

Taking into consideration the apparent lack of psychiatric specificity in both the frontal and medial temporal lobes and the unexpected benefit accruing from deep central damage, one may conjecture as to whether the primary mechanisms of mental disease are not far removed from all surface areas and lie deep within midline structures.

Comment may also be made on 1) the extreme physiologic sensitivity of the uncal region to stimulation but not to resection; and 2) to its epileptogenic properties following stimulation with possible improvement after resection. Additional studies will be undertaken to supplement the comprehensive work of Penfield and Jasper, Bailey and Gibbs and Walker.

Final mention should be made of the early superior psychiatric results obtained when combining orbital undercutting of the frontal lobes with medial resection of the temporal lobes. Results in this small number of cases are superior to any of six other fractional lobotomy procedures carried out by the authors. Combining removal of these areas in the frontal and temporal lobes permits quantitative removal of a large amount of tissue without the personality blunting which would inevitably occur if a similar sized resection were carried out in the superior surface of the frontal lobes or in a standard lobotomy procedure.

SUMMARY

1. A small series of both limited and extensive medial temporal lobe resections has been carried out on 19 patients. Six of these resections have

been combined with undercutting of the orbital surface of the frontal lobes.

2. Such operations are technically feasible without undue mortality, through bilateral supraorbital trephinations.

3. When surgery has been limited to the medial surface of the temporal lobes, the early psychiatric results have been unimpressive. When surgery has included a combination of both medial temporal lobe resections plus orbital undercutting of the frontal lobes, the psychiatric results have been encouraging.

4. Psychiatric comparison has been made of the results following limited and extensive medial temporal lobe resections with fractional undercutting operations of various areas of the frontal lobes and with standard frontal lobotomy. The results indicate little specificity in the effect of various resections on the pyschoses, but a considerable specificity in their effect on personality. Resections of either orbital or medial temporal lobe surfaces appear to cause less personality deficit than do resections of the superior surface of the frontal lobes.

5. Physiologically, the uncal region shows extreme sensitivity to stimulation but not to resection.

6. Comment is made on the unexpected psychiatric improvement following damage to deeper midline structures.[2]

7. Further work will be done to determine the effects of medial temporal lobe surgery on epilepsy.

The authors wish to extend their appreciation for the cooperation and technical assistance extended by the following:

Dr. Ronald H. Kettle, Supt., Norwich State Hospital. Dr. Edgar C. Yerbury, Supt., Connecticut State Hospital. Clinical and operative staffs of the above two hospitals. Miss Miriam Clark and Miss Alice Dennan, EEG technicians, Hartford Hospital.

BIBLIOGRAPHY

1. Alford, Leland B.: The localization of the mental functions: A new conception. South. Med. J., *43:* 262–265, 1950.
2. Bailey, P. C. and Gibbs, F. A.: Surgical treatment of psychomotor epilepsy. J. A. M. A., *145:* 315, 1951.
3. Bailey, P. C., Bonin, G. von, Davis, E. W., Garol, H. W. and McCulloch, W. S.: Further observations on associational pathways in the brain of Macaca mulatta. J. Neuropath. exp. Neurol., *3:* 413–415, 1944.
4. Bard, P. and Mountcastle, V. B.: Some forebrain mechanisms invalued in the expression of rage with special reference to the suppression of angry behavior. Res. Publ. A.R.N.M.D., *27:* 362–404, 1948.
5. Bateman, J. F. and Papez, J. W.: Significance of the thalamus in psychoses. J. Clin. & Exp. Psychopath., *12:* 89–103, 1951.

[2] The two cases sustaining severe midbrain damage (189, I. S., and 321, A. Z.) have now been followed just under two years and just under one year, respectively. They have continued to show complete clinical remission of their psychoses, remaining at home, and the second case is now applying for a job.

6. Board of Control, England and Wales: Prefrontal Lobotomy in 1000 Cases. London, H. M. Stationery Office, 1947.
7. Brodal, A.: The hippocampus and the sense of smell. J. Comp. Neurol., *79:* 277–296, 1943.
8. Bucy, P. C. and Kluver, H.: Anatomic changes secondary to temporal lobectomy. Arch. Neurol. Psychiat., *44:* 1142–1146, 1940.
9. Fulton, J. F.: Functional Localization in Relation to Frontal Lobotomy, 133 pp. New York, Oxford University Press, 1949.
10. Guillaume, J. and Mazar, G.: Personal communication, to be published.
11. Henry, C. E., Scoville, W. B. and Dunsmore, R. H.: Electrical stimulation and recording from the uncus and the orbital brain. Fourth Ann. Meet., Amer. EEG. Soc., June, 1950.
12. Kaada, B. R., Pribram, K. H. and Epstein, J. A.: Respiratory and vascular responses in monkeys from temporal pole, insula, orbital surface and cingulate gyrus. J. Neurophysiol., *12:* 347–356, 1949.
13. Lennox, M. A., Dunsmore, R. H., Epstein, J. A. and Pribram, K. H.: Electrocorticographic results of stimulation of the posterior orbital, temporal, and cingulate areas of Macaca mulatta. J. Neurophysiol., *13:* 383–388, 1950.
14. Liberson, W. T., Scoville, W. B. and Dunsmore, R. H.: Stimulation studies of the prefrontal lobe and uncus in man. EEG Clin. Neurophysiol., *3:* 1–8, 1951.
15. MacLean, P. D.: Developments in EEG: The basal and temporal regions. Yale J. of Biol. and Med., *22:* 437–451, 1950.
16. MacLean, P. D.: Psychosomatic disease and the "visceral brain". Psychosom. Med., *11:* 6, 1949.
17. Moore, B. E., Friedman, S., Simon, B. and Farmer, J.: A cooperative clinical study of lobotomy. A.R.N.M.D., Chapt. 35, 769–794, 1950.
18. Obrador, A.: Las modernas intervenciones quirurgicus en psiquiatria. Madrid, Editorial Paz. Montalvo, 1947.
19. Papez, J. W.: A proposed mechanism of emotion. Arch. Neurol. Psychiat., *38:* 729–743, 1937.
20. Penfield, W. and Rasmussen, T.: The cerebral cortex of man. New York, Macmillan, 1950.
21. Pribram, K. H., Lennox, M. A. and Dunsmore, R. H.: Some connections of the orbitofrontal, temporal, limbic and hippocampal areas of Macaca mulatta. J. Neurophysiol., *13:* 127–135, 1950.
22. Ruch, T. C. and Shenkin, H. A.: The relation of area 13 on orbital surface of frontal lobes to hyperactivity and hyperphagia in monkeys. J. Neurophysiol., *6:* 349–60, 1943.
23. Scoville, W. B., Wilk, E. K. and Pepe, A. J.: Selective cortical undercutting. Am. J. Psychiatry, *107:* 730–738, 1951.
24. Scoville, W. B.: Selective cortical undercutting as a means of modifying and studying the frontal lobe function in man. J. Neurosurg., *6:* 65, 1949.
25. Smith, W. K.: Non-olfactory functions of the pyriform-amygdaloid-hippocampal complex. Fed. Proc., *9:* 118, 1950.
26. Thompson, A. F. and Walker, A. E.: Behavioral alterations following lesions of medial surface temporal lobe. Folia psychiat. neurol. et neurochir. neerl., *53:* 444–452, 1950.
27. Walker, A. E.: Personal communication re unpublished data.
28. Walker, A. E.: A cytoarchitectural study of the prefrontal area of the macaque monkey. J. Comp. Neurol., *73:* 59–86, 87–115, 1940.
29. Williams, J. M. and Freeman, W.: Amygdaloidectomy for the suppression of auditory hallucinations. Med. Ann. D. C., *20:* 192–196, 1951.
30. Yakovlev, P. I.: Motility, behavior and the brain. J. Nerv. Ment. Dis., *107:* 313–335, 1948.

SUMMARY OF PAPERS XXVI TO XXX

A. EARL WALKER, *Baltimore*

The papers in this section of the program have emphasized more the limitations and the prognostic implications of prefrontal lobotomy than the therapeutic successes which follow its use. Drs. Williams and Freeman, after showing us what might be accomplished in adults by lobotomy, emphasized that psychosis in childhood appears to be more malignant and less responsive to psychosurgery than in adults. That hyperreactivity responds better than the other aspects of mental disturbance is quite in keeping with our concepts of the physiology of the frontal lobe and our experience with lobotomy in adults. It is perhaps noteworthy that the children operated upon, with one exception had regressive traits, such as seclusiveness and asocial tendencies, but little or no anxiety. The one patient, in whom anxiety and emotional agitation were prominent, was able to return to school following lobotomy. Drs. Jenkins and Holsopple discuss the problem of research design in lobotomy, both from the theoretical and practical standpoints. Admittedly the problem is a serious one, and much of the difficulty surrounds the question of controls, not only of the patient but of the examiners who will assess the state of the patient. It is just as important that the physician have no knowledge of whether he is examining a control patient or an operative case. The criteria of assessment having been well considered by the authors, I would point out that not only tests designed to bring out flexibility of personality, emotional reactivity, et cetera, which are, after all, only arbitrary criteria, are necessary, but also scales to evaluate the social and economic adjustment of the patient. Frequently the relatives of a patient can tell more about the end result than a battery of specialized psychological tests, and their impressions should not be neglected.

Drs. Solomon and Greenblatt's paper, as did the similar presentation given this morning, particularly stipulating that the reaction of the peripheral blood pressure to epinephrine and mecholyl should be of prognostic value, brings to mind the hypothesis of Hoagland and his associates relative to the role of the adreno-hypophyseal function in mental disease and to the more general concepts of Selye on stress. The extension of this preliminary study to a much larger series by the authors will be awaited with great interest by both psychiatrists and neurophysiologists.

Dr. Gibbs and his associates called attention to the localization of the spike focus in the anterior temporal region in psychomotor epilepsy. In

these cases 49 per cent of the patients had some type of psychiatric disorder. When the seizures were relieved by anterior temporal lobotomy the psychiatric state of 14 of the 33 patients was greatly relieved. With bilateral foci, 3 of 31 patients were markedly improved when a unilateral temporal lobotomy was done. Unfortunately, Dr. Gibbs did not have time to tell us the time of follow-up or the psychological states of the patients following temporal lobotomy.

In my experience the personality is not always unchanged by temporal lobotomy for psychomotor epilepsy. In some patients we have seen changes similar to those after frontal lobotomy. One charming woman of 50 became quite childish and irresponsible after a temporal lobotomy. Once, while unattended at a dime store, she had the clerk wrap up a pile of colorful knickknacks, and then, discovering she had no money, she called across the store for her nurse. While the nurse was explaining the situation, the patient wandered to another counter and repeated the entire performance.

Dr. Scoville presented an interesting series of cases on the medial temporal lobotomy. Their conclusion that surgery limited to the medial surface of the temporal lobes has been largely of a negative character will not be questioned by other people who have carried out such operations. Dr. Tuerk and I have studied four schizophrenics on whom I removed both amygdalae approximately two years ago. Only one is improved. Hallucinations are still present in all of these cases. In this connection, I wonder whether Dr. Williams has any explanation for the relief of hallucinations in the one patient that he mentioned?

It is interesting that the uncal region shows extreme sensitivity to stimulation but that its resection does not seem to cause many changes in somatic or autonomic spheres. Why there is this difference between man and lower primates, is not clear. Dr. Thomson and I found that in a previously normal monkey, ablation of the temporal uncus and amygdala will produce a tame animal, particularly noticeable if the animal was somewhat ferocious before the operation.

I note also in the presentations on the temporal lobe that whereas following frontal lobotomy stress was laid on the improvement of the patient six, nine, and twelve months after the operation, in patients having temporal lobotomies I got the impression that an initial improvement often deteriorated with time.

The essayists are to be congratulated upon their clear and excellent papers presented in such an objective and conservative manner. In the case of temporal lobotomy, the complex and complicated nature of the disorder attacked, as well as the subtle alterations produced by the operation, make an evaluation of its therapeutic possibilities difficult. But with such frank approaches as we have heard today, an early appraisal should not be impossible.

DISCUSSION

Dr. Paul H. Hoch [New York, N. Y.]: I should like to ask Dr. Holsopple if his material was divided between patients who were deteriorated and patients who were not deteriorated. In our case material we found a marked difference in the therapeutic outcome in patients who were suffering from chronic psychoneuroses or the pseudoneurotic form of schizophrenia against patients who were deteriorated schizophrenics.

I should also like Dr. Greenblatt to clarify one point for me. If mecholyl was used as a prognostic test and the operation was performed on patients who failed with other psychiatric procedures, how did this mecholyl test work in the patients before they received ECT? Did the mecholyl show a positive result for ECT and later also for lobotomy, or did it show a different response in relationship to ECT than to lobotomy? I am not quite clear about this point.

Dr. James Q. Holsopple: All of our patients are considered to be quite deteriorated, that being one of the criteria for lobotomy in most V.A. hospitals.

It will be possible, when we have sufficient data, to break those down and study the degree of deterioration. We certainly shall want to do that.

Dr. Jonathan M. Williams: It is possible that in our first case we inadvertently stumbled on the one type of case that would respond. This was a lad with organic brain disease, deafness, pyramidal tract signs and convulsions early in life. In this particular individual the response to amygdaloidectomy was quite remarkable and he has continued, over a year now, to be free of hallucinations. In the case of the child I mentioned in my presentation today, her psychosis has continued unabated although she is sufficiently manageable now to be at home with her parents and we do not have clear evidence that the hallucinations are completely gone although her preoperative behavior, which suggested hallucinosis, has been largely obliterated. It is quite possible that the organic cases with hallucinations do respond whereas the others are less likely to do so.

Chairman Pool: We have two questions from the floor. The first is addressed to Dr. Gibbs and is signed by Dr. M. Rosenbaum. It reads:

"What do you mean by epileptic personality?"

Dr. Frederic A. Gibbs: Dr. Rosenbaum has asked my definition of "epileptic personality." In my opinion the term is without meaning and I did not intend to use it. Personality disturbances in patients with psychomotor epilepsy include almost all the varieties of psychiatric disorder. Some of the patients in the present series were termed by competent psychiatrists "hysterical", "paranoid", "schizoid", etc., and even when the presence of epileptic disorder was demonstrated a review of the psychiatric findings revealed no reason for changing the psychiatric impression.

Although the psychiatric complications of epilepsy are non-specific, the location of the epileptic disorder in patients with epilepsy and psychosis or severe personality disorders is more-or-less specific; in the majority of cases an epileptic focus is demonstrable in the anterior temporal lobe.

Dr. Walker has said that some of his patients were childish and irresponsible after temporal lobectomy. We had expected such a result but have not encountered it in this series of 64 cases. Only one of our patients was psychiatrically worse after the operation. We have been operating on patients who for the most part were very seriously affected in the psychiatric sphere. Post-operatively these patients were usually the same, or improved. Persistent deficit symptoms did not occur in our patients even after bilateral temporal lobectomy.

I certainly agree with Dr. Walker that the best therapeutic index is what the family says about the patient. We believe we have succeeded in obtaining a good therapeutic result when the family makes such a comment as: "He was terrible and now he is angelic." But degree of rehabilitation is another useful index. One of our patients was withdrawn, unable to study or work; he is now a junior at a great university and is socially and scholastically successful. Another had earned no money for twelve years, after bilateral temporal lobectomy he is supporting his family by working in a tractor factory. He is not a superior person, but he is certainly not childish or irresponsible.

In only one case has a patient relapsed after improving; this was a patient with a bilateral anterior temporal focus on whom a unilateral anterior temporal lobectomy was performed. Considering the variability of the clinical state in epilepsy it is surprising that a high percentage of patients do not relapse. The trend seems to be in the opposite direction. In our experience, patients who improve in the first six months continue to show improvement over the next two or three years.

Chairman Pool: Dr. Gibbs, while you are there, I shou'd like to ask another question to clear up an apparent discrepancy between the remarks made by yourself and Dr. Earl Walker, and I have great respect for both views, as you well know. It seems to me that a difference in the type of patient selected for operation may be one explanation for the discrepancy in the reported results. The other factor that occurs to me is the effect of quantity of tissue removed. And I should like to ask you how much, in grams of cortex or area of cortex, is removed in the anterior temporal lobotomy that you and Dr. Bailey and Dr. Green have performed.

Dr. Frederic A. Gibbs: Dr. Pool's questions are highly pertinent, but they should be answered by Doctors Bailey, Green and Amador. They are answered in the text of our report, but I might point out that at present the operation is not standardized. The extent of the disorder (as electroencephalographically delimited) varies from case to case. We have proceeded on the general principle that as much tissue should be removed around the focus as is consistent with our knowledge (and ignorance) of the importance of various temporal lobe structures. With an increase in knowledge the operation has become more radical and the therapeutic results better.

We are dealing with severely afflicted patients comparable to those selected for frontal lobotomy. Better therapeutic results might be obtained in a group with less severe clinical and electroencephalographic manifestations.

Chairman Pool: We have one more question from the floor, submitted to Dr. Scoville by Dr. Koskoff. We shall have to limit the reply to this to two minutes.

"Why should the psychiatric symptoms lie in the deepest structures? Since not found in the more superficial, why not in the total neural pattern?"

Dr. W. B. Scoville: This sounds as reasonable to me as my own theory. The speaker wishes to comment on the apparent discrepancy in animal and human conduct and physiology following stimulation and ablation in the cingulate gyrus, posterior orbital and uncal regions of the brain. The speaker feels this should not be a cause of surprise, and is gratified that Dr. Walker has expressed the same opinion, when one realizes the extraordinary disparity of physiologic results found in orbito temporal ablations when carried out on monkeys by Bucy and on cats by Bard.

Section VIII

CHAPTER XXXI

CINGULATE CORTEX ISOLATION FOR THE TREATMENT OF PSYCHOSES AND PSYCHONEUROSES[1]

KENNETH E. LIVINGSTON

Since the bold contribution of Egaz Moniz (1) in 1936, frontal lobotomy has been carried out on many thousands of individuals with results that have established it as an important part of our armamentarium in dealing with mental disease. We know that extensive destructive lesions of the frontal lobes can significantly modify behavior in certain cases of psychosis and psychoneurosis. Recently, more critical study of the effects of the standard lobotomy procedure, such as reported to this association by Rylander (2) in 1948, emphasizes clearly the importance of Fulton's (3, 4) admonition that a more limited interference is indicated if undesirable side effects are to be avoided. However, in spite of extensive experience with modified and restricted forms of the lobotomy procedure, the minimal effective anatomical lesion has not been defined and the physiological basis for the operation has not yet been clearly established.

Earlier physiological investigations indicated that certain autonomic responses could be elicited from the posterior frontal cortex (5), but until recently no physiological functions had been ascribed to the frontal areas isolated or significantly altered by lobotomy. Extensive study of the hitherto silent areas of the frontal lobe has produced experimental observations (6–13) which may shed light on the clinical procedure. Attention has been focused on two regions found to have important autonomic connections—the posterior orbital surface and the anterior cingulate gyrus, or Area 24. In view of the importance of autonomic activity in emotional response, it is possible that cortical levels of autonomic function may play a significant role in behavior disorder and mental disease.

[1] Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

The anterior cingulate gyrus, or Area 24, has been shown through investigations of Smith, (7) and Ward and McCulloch (8) to produce respiratory, cardiac and pupillary responses and, in addition, to produce profound suppressor effects on cortical activity and on peripheral motor function. Wilbur Smith, in 1945, summarized these effects as follows: "Excitation of the rostral portion of the cingulate gyrus in the monkey produces a complex response characterized by opening of the eyes, dilatation of the pupils, changes in facial expression, changes in respiration and cardiovascular status, vocalization, pilo-erection, cessation of muscular movement and relaxation of muscular tension." Ward (8, 11, 12) confirmed and extended these observations and both Ward and Smith noted behavioral changes following ablation of Area 24 in monkeys, which further suggested the possibility that this area might have clinical importance. Following ablation there is a significant change in the animal's social behavior. The monkey loses its preoperative shyness and appears less blocked by apprehension and fear and is neither pugnacious nor aggressive.

Data regarding the effects of Area 24 in lesions in the human is scanty and inconclusive. Direct surgical excision of this area has been carried out by Ward (11) in two cases and by Pool (14) in one case. Scoville (15) reported cortical undercutting designed to isolate Area 24 in 39 cases but considered the procedure more difficult and dangerous and felt that the clinical results probably compared *un*favorably with those of other frontal lobe areas.

Since March of 1949 we have had an opportunity to carry out a clinical study of lesions of the anterior cingulate gyrus region through the cooperation of the Veterans Administration and the staff of the Veterans Administration Hospital in Roseburg, Oregon, a chronic neuropsychiatric hospital of 600 beds.

The operative procedure is done transcortically under direct vision, using the Lyerly-Poppen approach, with the superior surface and anterior tip of the lateral ventricle serving as the major anatomical landmarks. The parasagittal gray matter is denuded of subjacent white matter in a strip extending 2 cm. anterior to the tip of the frontal horn and extending posteriorly a distance of 4 cm. along the roof of the lateral ventricle. This effectively isolates the cortex of the anterior cingulate gyrus. The operative procedure has now been carried out on a total of 72 patients, with 1 hospital death. Fifty-five patients were operated on at the Veterans Hospital and form the basis of this report. The operations were carried out with the understanding that the Area 24 lesion might be inadequate to produce clinical results and in each instance the operative permit provided for a possible second operation.

In the Veterans Hospital series, 41 patients have been followed for longer

than one year following operation and of these, 24 patients have been followed for longer than two years. Our discussion will be based primarily on the group with postoperative follow-up of two years or longer.

Patients were evaluated and selected for lobotomy by a review board consisting of three well-qualified psychiatrists, a psychologist and a neurosurgeon. Except for the neurosurgeon this board of review held no brief for Area 24 and, in fact, had a healthy skepticism for the whole problem of lobotomy. Included in the first 24 patients accepted for lobtomy were many of the hospital's most serious problems. The average period of hospitalization was over four years. All of these patients had been under observation and active treatment at the Veterans Administration Hospital in Roseburg for at least a year prior to surgical treatment. On the basis of this period of preoperative study and evaluation, the expectancy for rehabilitation and hospital discharge for this group of patients was discouragingly low. Only two patients were sufficiently intact that the board considered rehabilitation and discharge possible. Seven of the 24 patients were selected with some expectation of benefit in terms of modification of their psychosis. Six patients were rated as intermediate, feeling that there was some possibility of benefit from operation but that the degree of improvement would be only slight to moderate. Eleven patients were rated as poor in expectation of modifying the character of their psychosis and were accepted reluctantly for surgery on the basis that the lobotomy procedure might reduce their overt aggression and danger to other patients. The personality disorganization and the depth of psychosis were so marked in these patients that the board felt that there was no reasonable prospect that they would be otherwise significantly improved. Evaluation of the patients in these three preoperative groupings at the end of the two year follow-up period is of some interest. Of the 7 patients in whom improvement was expected, all have been discharged from the hospital. Two of these were patients previously mentioned who did not have serious personality disorganization, but the additional 5 patients all had profound psychoses. Of the 6 patients rated as intermediate 1 has been discharged; the other 5 have shown only slight to moderate improvement. Of the 11 patients rated as poor, with no expectation of rehabilitation, 4 have been discharged from the hospital and 1 is now considered markedly improved. Criteria for discharge are critical and all of the patients now discharged from the hospital have maintained an adjustment outside of the hospital for a period of at least a year. Of the 12 discharged patients 5 are gainfully employed, 3 are making good adjustment with family assistance, 1 is making satisfactory adjustment independently and 2 are making borderline adjustment.[2]

[2] One patient was drowned in a fishing accident on the Umpqua River 14 months after release from the hospital.

The remaining 12 patients have shown definite but less striking improvement. Four of this group are now making a good hospital adjustment, but the remaining eight, although benefitted, still presented serious problems six to eighteen months after cingulate isolation. In an effort to improve the results in these 8 patients we have at a second operation superimposed the standard radical lobotomy lesion by transecting frontal white matter in the coronal plane at the level of the anterior horn of the lateral ventricles. Follow-up periods are not sufficiently long, but to date we have not added significantly to the improvement which these patients showed following cingulate isolation.

In 4 separated cases in this series we carried out a control procedure in which the skin incision is made and the bone button removed but no cerebral lesion produced. Each of these patients was included in a group of four operated on at one time, three of whom had a standard anterior cingulate isolation. The four patients were carried as a group through the entire postoperative routine without knowledge on the part of the patients or other hospital personnel that these control patients had not been subjected to the complete surgical procedure. None of these patients showed even slight improvement during their period of control study and all were subjected to cingulate isolation one to three months later. This group serves to some extent as a control for factors other than the surgical lesion itself.

I should like to discuss two observations which are difficult to quantitate but which we believe may be significant. First is the surprising uniformity of the early postoperative changes which occur in many of these patients. The majority show a striking mood change characterized by pleasantness and evidence of contentment, absence of hostility and fear, and exhibit an emotional coloring and reactivity which often is strikingly normal in quality. In some cases, this change is transient and in a few instances this change does not appear to occur at all but it is sufficiently frequent to characterize the early postoperative response to the procedure. A second observation which may be of interest is the relatively long period over which some of these patients may continue to show marked change. Two patients considered by all observers to have made very satisfactory postoperative social adjustment and rated at six months follow-up as excellent results underwent abrupt change (one at seven and the other at ten months) reverting within a period of a few days from their high level of adjustment back toward preoperative status. In one instance this change appeared to occur within the space of a few hours and with evidence that the patient had some insight into the process. On the other hand, a number of patients who have shown relatively slight improvement at a three month interval have continued slow progress in the direction of normalcy and at the end of a year following operation have achieved such satisfactory adjustment that they are accepted for discharge.

We have been impressed by the consistency of the immediate postoperative change in the majority of patients in whom the anterior cingulate cortex has been isolated and also by the prolonged period during which reorganization of emotional response and behavior appears to be taking place in many of these individuals.

In conclusion, we have attempted to produce a limited surgical lesion of the frontal lobes, restricted as far as possible to the anterior cingulate gyrus.

At least in some degree the implications of previous physiological investigation of this area are borne out by clinical experience.

Although many important questions remain to be answered regarding the effects of anterior cingulate isolation in the treatment of psychoses and psychoneuroses, experience indicates that selective isolation of the anterior cingulate gyrus area is surgically feasible and that the results of such lesions are sufficient to justify further clinical study.

BIBLIOGRAPHY

1. Moniz, Egaz: Lisbon Med., *13:* 141–151, 1936.
2. Rylander, Gosta: A.R.N.M.D., *27:* 691–705, 1947.
3. Fulton, J. F.: Functional Localization in the Frontal Lobes and Cerebellum. The Clarendon Press, Oxford, 1949.
4. Fulton, J. F.: Frontal Lobotomy and Affective Behavior. W. W. Norton & Co., New York, 1951.
5. Kennard, M. A.: The Precentral Motor Cortex, pp. 294–306. University of Illinois Press, 1949.
6. Bailey, P. and Sweet, W. H.: J. Physiol., *1:* 405–412, 1940.
7. Smith, W. K.: J. Physiol., *8:* 241–255, 1945.
8. Ward, A. A., Jr. and McCulloch, W. S.: J. Neurophysiol., *10:* 309–314, 1947.
9. Livingston, R. B., Fulton, J. F., Delgado, J. M. R., Sachs, E., Jr., Brendler, S. J. and Davis, G. D.: A.R.N.M.D., *27:* 405–420, 1948.
10. Livingston, R. B., Chapman, W. P., Livingston, K. E. and Kraintz, L.: A.R.N.M.D., *27:* 421–432, 1948.
11. Ward, A. A., Jr.: A.R.N.M.D., *27:* 438–445, 1948.
12. Ward, A. A., Jr.: J. Neurophysiol., *11:* 13–23, 1948.
13. Delgado, J. M. R. and Livingston, R. B.: J. Neurophysiol., *11:* 39–55, 1948.
14. Pool, L.: Selective Partial Ablation of the Frontal Cortex, pp. 41, 451. Paul B. Hoeber, Inc., New York, 1949.
15. Scoville, W. B., Wilk, E. K. and Pepe, A. J.: Selective cortical undercutting. Results in new method of fractional lobotomy. Am. J. Psychiatry, *107:* no. 10, 730–738, April, 1951.

CHAPTER XXXII

THALAMOTOMY AND HYPOTHALAMOTOMY FOR THE TREATMENT OF PSYCHOSES

E. A. SPIEGEL, H. T. WYCIS, H. FREED AND C. ORCHINIK

Over 4½ years have elapsed since our first thalamotomy (1) so that an attempt at evaluation of the long range effects of this procedure seems to be justified. Before a summary of our results is presented, it may be advisable to answer a question which is frequently raised, i.e., how do we know where we produced the lesions?

We attempted to check the position of the lesions postoperatively by roentgenologic studies. After the electrolysis had been finished, a droplet of pantopaque was injected in the area of electrolytic destruction. It seemed permissible to make such injections particularly in the area of the dorsomedial nucleus, since observations during the operation showed that stimulation of this nucleus does not produce untoward results and is not associated with painful sensations, so that one need not be concerned that irritative processes developing around the injected pantopaque droplets would induce undesirable sensory phenomena. Injection into electrolytically destroyed areas of the anterior thalamic nucleus likewise produced no untoward effects.

In table 52, one can compare the distances between the pantopaque shadows and the pineal center or the posterior commissure found on postoperative lateral roentgenograms with the distances planned preoperatively. Only such cases were selected in which the reference point, as well as the pantopaque shadow, could be clearly seen. For the preoperative visualization of the reference point and computation of the puncture, the skull was x-rayed with the stereoencephalotome (SET) in position and the actual distances were obtained from the measurements on the films by multiplying the latter with a factor $^5/_6$ that depended on the distances between the target of the x-ray tube, the median plane of the skull, and the x-ray film. The postoperative roentgenograms, however, were usually taken without the SET. In these instances the actual distances were calculated in the following way. From the preoperative roentgenograms taken with the SET in situ, the actual length of the brain L (maximum distance between the

internal tables of the frontal and the occipital bones) could be computed from the preoperative measurement (L preop.).

$$L = L \text{ preop.} \times {}^5/_6$$

From this value and the postoperative measurement of this length (L postop.) one obtains the value of the factor X, by which the measurements in the longitudinal direction of the skull taken on the postoperative lateral roentgenogram (D postop.) have to be multiplied in order to obtain the actual distances (D).

$$X \times L \text{ postop.} = L = L \text{ preop.} \times {}^5/_6$$

$$X = \frac{L \text{ preop.} \times {}^5/_6}{L \text{ postop.}}$$

$$D = X \times D \text{ postop.}$$ [1]

In order to exclude the subjective element as much as possible in the preparation of this table, the postoperative measurements were made by an observer who did not know the planned distances when he made the measurements. Most of these were done by Dr. Feferman, from the University of Minnesota Medical School, who spent some time with us in a study of this method.

Table 52 shows that in 12 of 20 lesions checked in the above described manner, the error was less than 1 mm.; in 7 cases it was 1 mm. or between 1 and 2 mm.; in one case it was above 2 mm. (3.5 mm.).

While the roentgenograms permit an evaluation of the lesions in relationship to the reference point, autopsy material provides a final answer to the question as to whether a lesion is correctly placed in a certain structure as intended. Sections through the thalamus of a schizophrenic patient who died of a carcinoma of the colon 2 years after dorsomedial thalamotomy (lesion of the dorsomedial nucleus) showed that the puncture lies rather symmetrically in the dorsomedial nuclei. In a second schizophrenic patient who died 6 weeks after the same type of operation when she had returned to a State Hospital and 0.8 mg. of Scopolamine had been administered, a large lesion was found in the caudal part of the dorsomedial nuclei on the right side and a smaller lesion in the lateral part of this nucleus on the left side.

Thus it seems that we attained a satisfactory degree of accuracy particularly since in the majority of our material the lesions were produced in the dorsomedial nuclei (dorsomedial thalamotomy), a relatively large ganglion,

[1] These computations are based on the assumption that the pantopaque shadow lies in the median plane. For a lesion 5.6 mm. lateral from the midline, this results in an error of 2.3%, which seems negligible for this comparison.

so that variations in the location of the lesions of 1 to 2 millimeters probably did not significantly affect the clinical results. In some instances we placed lesions in the much smaller anterior nuclei (anterior thalamotomy) or in the hypothalamus (hypothalamotomy). In these types of lesions an accurate position of the electrode is, of course, much more important than when one deals with the dorsomedial nuclei; if the pineal gland is not sufficiently calcified, the position of the posterior commissure or of the suprapineal recess should be determined by pneumoencephalography.

TABLE 52

Postoperative check on thalamotomy lesions: Relation of lesion in the thalamus to the pineal gland in lateral roentgenograms

PATIENT'S INITIAL AND NUMBER	COMPUTED DISTANCE OF PUNCTURE FROM CENTER OF PINEAL GLAND OR POSTERIOR COMMISSURE	DISTANCE OF PANTOPAQUE FROM REFERENCE POINT	ERROR
	mm.	*mm.*	*mm.*
L. T 22	11	10.9	0.1
C. T 24	13	12.5	0.5
W. T 25	13.6	14.6	1.0
C. T 27	12.5	9.0	3.5
R. T 28	12.7	12.3	0.4
B. T 30	13.0	13.3	0.3
M. T 34	13.0	14.6	1.6
N. T 35	12.5	12.5	0
S. T 36	12.0	12.5	0.5
M. T 38	13.8	13.3	0.5
L. T 39	13.0	12.4	0.6
W. T 41	13.0	11.2	1.8
A. T 42	13.0	12.5	0.5
P. T 43	13.0	14.0	1.0
C. T 44	13.0	13.0	0
M. T 47	13.1	11.6	1.5
Z. T 51	13.0	14.2	1.2
S. T 56	13.0	13.1	0.1
S. T 56	24.0	25.0	1.0
S. Mt25	6.0	5.8	0.2

Our material comprises 61 patients who were selected for operation after all conservative measures including shock treatments had failed. Their classification is summarized in table 53. Since some operations were performed in several stages and some patients were reoperated, a total of 93 operations were performed. Two of our early patients died postoperatively of hemorrhages, so that the case mortality is 3.27 per cent and the operative mortality 2.15 per cent.

As after the various types of frontal lobe surgery, the main therapeutic

effect of thalamotomy is found in the emotional sphere. The affective responses of the patient, his emotional tension, and his anxiety may be reduced; his hallucinations and delusions may fade, and his obsessions and compulsions may lose their force. His agitation may be allayed and he may become less assaultive and more easily manageable.

TABLE 53

	NUMBER OF CASES
Schizophrenia	45
Affective reaction types	5
Paranoid states	2
Obsessive-compulsive neurosis	3
Anxiety neurosis	5
Mental deficiency with agitation	1
Total	61

TABLE 54

Garrison's anxiety and complaint inventory

	N	PREOP.		POSTOP.		Diff.	% OF PREOP. MEAN	t	P
		Mean	Sigma	Mean	Sigma				
Anxiety—full inventory	10	60.9	37.6	47.0	34.1	−13.9	−23	1.9	0.1
Self-referred anxiety	10	22.6	14.9	16.5	12.8	−6.1	−27	1.6	0.2
Externalized anxiety	10	8.5	5.8	6.4	6.5	−2.1	−25	.9	0.4
Mixed anxiety	10	24.4	10.2	19.9	13.5	−4.5	−18	1.5	0.2
Self consciousness	10	30.5	20.6	22.8	18.2	−7.7	−25	1.8	0.1
Complaints grouped together	10	17.2	7.5	13.2	5.7	−3.7	−21	2.1	0.1
Physical complaints	10	16.2	6.4	13.1	4.8	−3.1	−19	1.6	0.2
Mental complaints	10	20.7	8.8	14.4	6.0	−5.3	−26	3.5	0.01
Mixed complaints	10	14.8	7.3	12.0	6.4	−2.8	−19	1.3	0.3

P (probability) .01 is significant, .1 may be significant, and the other values greater than .1 are not significant.

These clinical observations could be confirmed and amplified by psychological studies. Table 54 shows the results obtained with Garrison's (2) anxiety and complaint inventory. There is a decline in mental complaints that is significant at the .01 level. The decrease of full scale anxiety scores, of self consciousness, and of the three complaint inventories grouped together, may also be significant at the .1 level. These studies are being continued since more data are required in order to reach definite conclusions.

It was pointed out previously (3) that it is rather difficult to reach general conclusions on the basis of group data from Rorschach studies. But at least certain trends seem to be apparent in table 55 in which the changes found in Rorschach studies of 20 cases are tabulated. In $^2/_3$ of the patients in whom the time per response (T/R) was measured this value decreased

TABLE 55

Changes induced by thalamotomy in 20 cases as indicated by the Rorschach test

	INCREASE	DECREASE	UNCHANGED
R (total number of responses)	10	9	1
T (total time)*	9	6	—
T/R (time per response)*	5	10	—
RT(Ach) (reaction time to uncolored cards)	7	12	1
RT(C) (reaction time to colored cards)	5	15	
F+% (form well seen)	9	2	9
F (pure form response)	8	11	1
FK + F + FC (vista + pure form + touch-feeling response)	9	9	2
A + Ad (animal figures and parts of animals)	9	8	3
P (popular responses)†	8	5	6
O (original responses)†	4	6	9
ΣC (sum of color responses)	8	8	4
R to VIII–X (number of responses to cards VIII–X)	7	8	5
M (figures in human-like action)	6	7	7
FM (animals in action)	7	6	7
W (whole blot)	6	14	—
D (large detail)	11	5	4
Dd + S (small details and white space)	7	6	7
FC (definite form with bright color)	8	3	9
CF (bright color with indefinite form)	3	6	11
C (color)	3	5	12
K (3-dimensional shading)	1	3	16
m (inanimate movement)	1	4	15
C′ (achromatic surface color)	4	5	11
c (surface texture response)	5	4	11
Rejections	3	10	7

* Data for only 15 cases available.

† Data for only 19 cases available.

postoperatively suggesting a decrease in blocking; in $^1/_3$ of the cases T/R went up (fig. 38).

The average reaction time to the achromatic cards (fig. 39) was delayed preoperatively in 4 cases (between 28 and 47 sec.); this may be regarded as a sign of shading shock and as suggestive of a deep seated anxiety. In

3 of these 4 cases the reaction time decreased postoperatively by 15 to 37 sec. and in the fourth by 8 seconds. This decline may reflect a relief from anxiety.

The average reaction time (R.T.) to the color cards dropped in 15 of the 20 patients (fig. 40). In 7 cases it showed preoperative values between 29

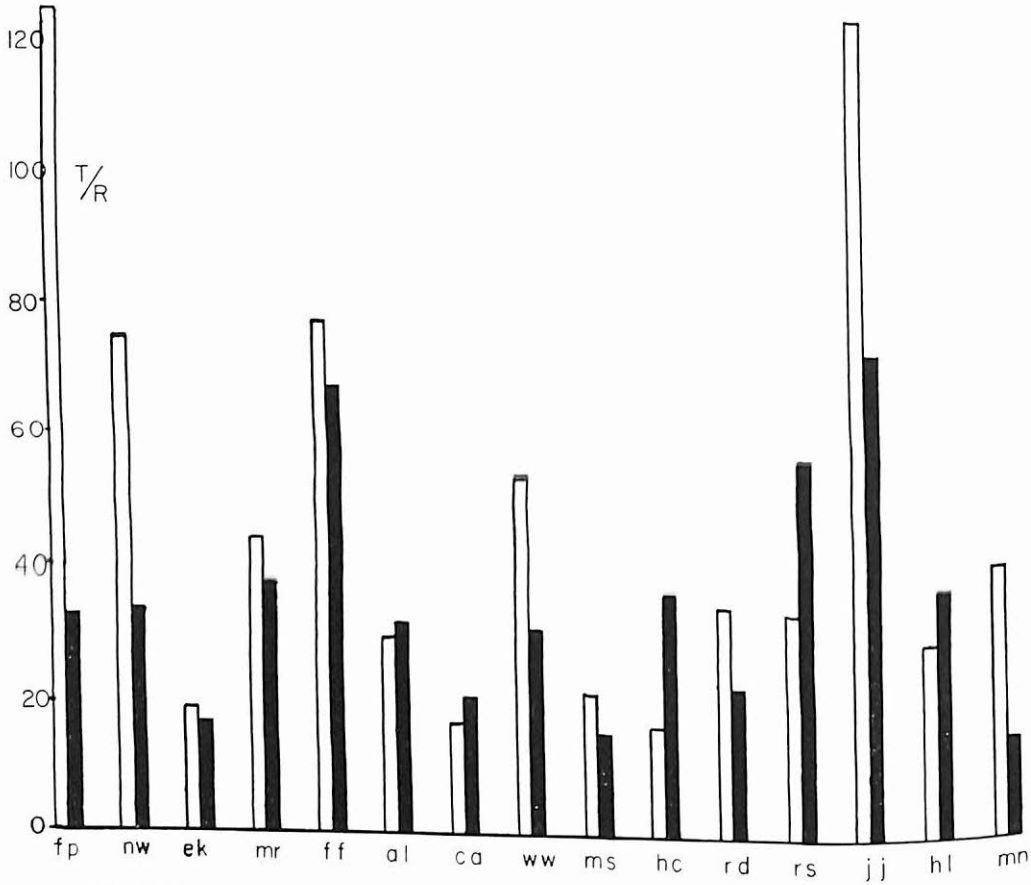


Fig. 38. Time per response (T/R) in 20 cases studied by the Rorschach method. Abscissa: initials of the patients. Ordinate: T/R in seconds. White columns: preoperative data. Black columns: postoperative data

and 101 sec.; in these cases with delayed R.T. the decline ranged between 11 and 86 sec. In 8 further cases that did not show a delay of the R.T. there were only slight decreases (only once more than 10 sec.). Increase of the R.T. was observed in 5 cases; in only one of these the increase was above 10 sec. Since the delay in the R.T. to color cards points to difficulties in meeting emotionally charged situations, it may be inferred that the patients in whom this R.T. declined became less upset by such situations after

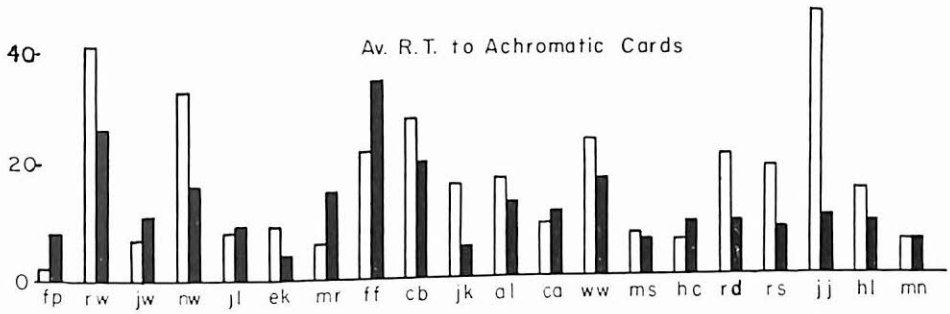


Fig. 39. Average reaction time to achromatic Rorschach cards (20 cases). Abscissa: initials of patients. Ordinate: T/R in seconds. White columns: preoperative data. Black columns: postoperative data.

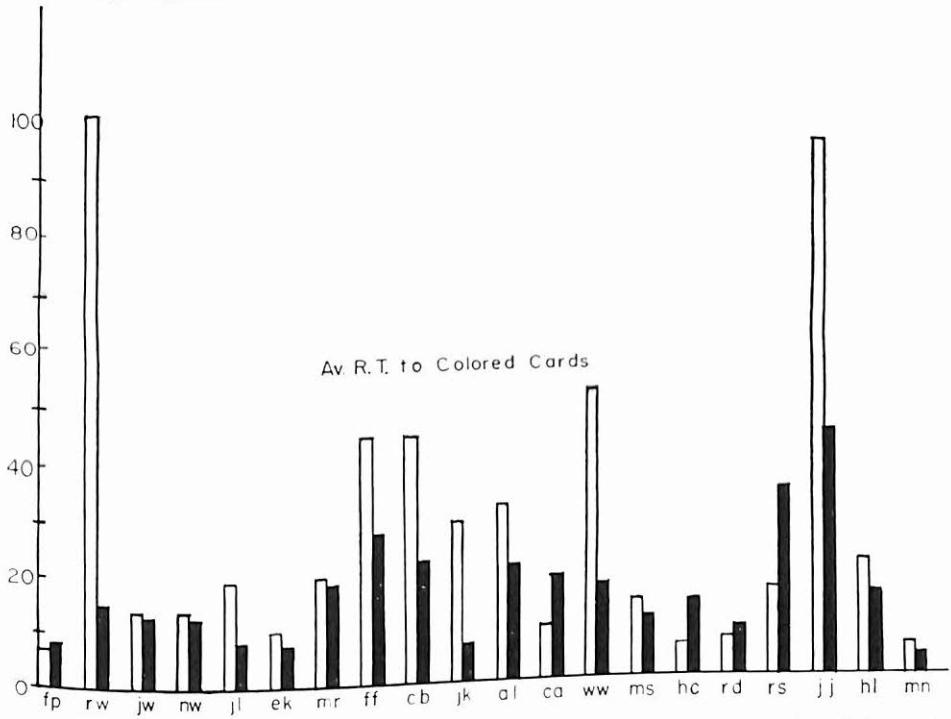


Fig. 40. Average reaction time to colored Rorschach cards (20 cases). Abscissa: initials of patients. Ordinate: T/R in seconds. White columns: preoperative data. Black columns: postoperative data.

thalamotomy. This is further suggested by the decline in the number of rejected cards. This number went down in 10 cases and up in only 3.

14 cases gave fewer W responses to the whole card after thalamotomy. There was a shift toward more D responses to major sections of the blot. Such a trend may be a reflection of a lessened attempt to generalize and

greater attention to the more commonplace and concrete. In this connection it may also be mentioned that P (popular responses) increased in 8 and decreased in 5 of 19 cases.

There appears to be a tendency toward increased use of color in a constructive fashion (FC goes up in 8 cases and down in only 3). This may be evidence of higher social participation and expression of emotion. However, uncontrolled or impulsive emotional outbursts may even decline somewhat (CF down 6, up 3; C down 5, up 3). The increase in F+% (F+% up 9, down 2) probably reflects the patients' improved intellectual control and would be expected as personality difficulties became less severe.

The trends revealed by the Rorschach record may be summed up as follows. Some patients appear to have less difficulty meeting and coping with previously upsetting or emotionally charged situations. They seem better able to show emotional expression without becoming blocked or resorting to uncontrolled outbursts of feeling. They appear to be somewhat more practical and concrete in their thinking and less apt to generalize.

The social status of 51 patients who have been observed over a period of ½ year to 4½ years is summarized in table 56. The first three cases were not included because only rather small lesions had been produced, since we were not familiar with the possible sequelae of the procedure, and the effects of these small lesions, if any, were quickly compensated. In the patients surveyed in table 56, on each side either 5 foci of electrocoagulation by high frequency current or 3 rosettes, each consisting of 4 ovoid (4 x 3 mm.) electrolytic lesions were produced. The classification follows the principles laid down at the first International Psychosurgical Congress. Group A consists of patients who returned home with nearly full working capacity; group B, patients who were able to return home but whose working abilities were diminished; group C, patients who remained hospitalized but are relieved of some of their symptoms and are more easily manageable; group D, patients who are not improved; and group E, patients who were made worse. In subgroups B_t and C_t are cases in which improvement was only temporary.

In some cases lesions of the hypo- and subthalamus, or of the anterior nuclei were produced. The operation on the hypo- and subthalamus was prompted by animal experiments showing that subthalamic lesions in cats transitorily induced somnolence and diminution of reactivity (4) and that lesions of lateral parts of the hypothalamus transformed wild monkeys into tame ones (5).

Hypothalamotomy was performed in 20 instances in combination with dorsomedial thalamotomy or alone in cases of relapses after dorsomedial or anterior thalamotomy. In view of the vital importance of this region and of the vicinity of the optic chiasm, we were reluctant to produce large

lesions of this region and made through one puncture canal on each side only one to three small electrolytic lesions of the lateral hypothalamus and of the overlying subthalamus.

Hypothalamotomy was originally performed in a two-stage operation, the lesions being produced first on the right, and some weeks later on the left side. After it could be established that the bilateral lesions also were rather well tolerated by the patients, we decided to perform the operation in one stage, chiefly in very agitated and assaultive schizophrenic patients. The by-effects of these lesions such as somnolence, increase in temperature, polyuria, vasodilatation, inequality of the pupils, were only transitory, probably due to the small size of the electrolytic lesions. The therapeutic

TABLE 56

Status of patients observed for ½–4½ years

	NO.	A	B	C	B_t	C_t	D	E
Schizophrenia	37	5	5	11	4	3	9	
Affective reaction type	4		1	1		1	1	
Paranoid states	2						2	
Obsessive-compulsive neurosis	3			1	1		1	
Anxiety neuroses	5	3	1	1				
Total	51	8	7	14	5	4	13	0
Percentage		15.7	13.7	27.4	9.8	7.8	25.6	
		29.4				43.2		

results are summed up in table 57, in which the same classification is used as in table 56. One half of the patients fall into group C. These patients who were fearful, agitated, assaultive, and or hallucinatory were relieved of their anxiety, became more quiet, and more easily manageable.

The production of lesions in the anterior nuclei (anterior thalamotomy) is based upon the fact that these nuclei are connected to the cingular gyrus (Le Gros Clark, Walker) and upon the experience that following undercutting of the cingular gyrus or sectioning of its fiber connections with the anterior nuclei in instances of psychosis and severe psychoneurosis changes comparable to those observed after prefrontal leucotomy were noticed (Ward (6), Solomon and his associates, Bockoven and Greenblatt (7), Glees et al. (8)).

In experiments on cats we observed that stimulation of the anterior nucleus in unanesthetized animals produces a "reaction of alertness" (the head is raised, the eyes are opened, the animal looks around and starts

to walk). This is probably due to activation of hypothalamic mechanisms. Bilateral lesion of these nuclei in cats produced a brief state of catelepsy followed by a transient period of reduced reactivity to threatening or painful stimuli (9).

We studied the effects of bilateral lesions of the anterior nuclei (anterior thalamotomy) on 8 schizophrenic patients (table 58). Of 3 schizophrenic patients in whom bilateral lesions of the anterior nuclei were produced, one showed only a shortlived improvement, 2 became less withdrawn and more alert, mingling more with the other patients. However, the postoperative period is too short to draw definite conclusions. In 3 cases, dorsomedial and anterior thalamotomy were combined. Two of them became more easily manageable. The third will be discussed when we shall deal with thalamotomy following prefrontal lobotomy. In the last group are two schizophrenic patients in whom lesions of the dorsomedial nuclei and of the hypothalamus had proved to be insufficient or of only transient benefit. In one of these cases the thalamic operations as well as a prefrontal lobotomy failed to change the patient's condition. The second patient had improved considerably following lesions of the dorsomedial nuclei and the hypothalamus but relapsed after two years and again became disturbed, expressed paranoid delusions and threatened to kill people. After bilateral lesions of the anterior nuclei he became slightly euphoric and anxious to secure gainful occupation. At the time of his dismissal from the hospital he was friendly and more in contact with reality than previously. This improvement has now been maintained for nearly a year.

TABLE 57

Hypothalamotomy

	NO.	B	B_t	C	C_t	D
Hypothalamotomy (bilateral) following dorsomedial thalamotomy	5		1	1	1	2
Hypothalamotomy (bilateral) following anterior thalamotomy	1	1				
Hypothalamotomy (unilateral) post dorsomedial thalamotomy	3			2		1
Dorsomedial plus unilateral hypothalamotomy	3	1		1		1
Dorsomedial thalamotomy plus bilateral hypothalamotomy	8			6	1	1
Total	20	2	1	10	2	5

Our experiences with these various procedures induce us to regard, at the present time, dorsomedial thalamotomy as the method of choice if

one decides to operate on the diencephalon because the dorsomedial nucleus is relatively large and the risk of undesirable by-effects is small. Lesions of the anterior nucleus and of the hypothalamus may be reserved for cases in which dorsomedial thalamotomy is ineffective or relapses appear following this operation.

What is the price in long-lasting functional deficits or other undesirable by-effects the patient has to pay for the relief from emotional disturbances? One patient shows weakness and awkwardness of the right hand, with a tendency to hyperextension of the 4th and 5th finger, 3 years after thalamotomy. In one patient there is still a paralysis of upward gaze, while symptoms of motor impairment in the face or in the leg and of incontinence that had developed in other instances were only transitory. More or less marked memory defects are still noticeable in 3 cases. In 4 psychotic patients the Wechsler-Bellevue Intelligence Test revealed a drop of the

TABLE 58

Anterior thalamotomy

	NO.	B	C	D
Lesion of anterior nuclei alone	3		2	1
Dorsomedial plus anterior thalamotomy	3	1?	2	
Anterior thalamotomy after dorsomedial and hypothalamotomy	2	1		1

full-scale I.Q. of 5 or more points. Two of them were retested between ½ and 1 year after operation and two over one year after operation. Their failure to regain the preoperative level may, at least partly, be due to the underlying psychosis. On the other hand, a definite increase of the I.Q. (of over 10 points) was noticed in 5 patients, perhaps because they were less disturbed by their emotional disorder and therefore better able to concentrate on the test problems.

There persisted a diminution of initiative in 4 patients. One of these is also careless in personal appearance; this may, however, be the combined effect of thalamotomy and of a preceding prefrontal leucotomy. Most of the other undesirable sequelae of the prefrontal lobotomy such as lack of restraint, of tact, or of discipline, outbursts of temper, childishness, facetiousness, and distractibility failed to appear in our material. The same applies to epileptiform convulsions except for one instance in which only a single convulsion developed.

It seems of particular interest to compare the effects of frontal lobe operations with those of thalamotomy. Since adequate material for such a comparison is not available at the present time, we can compare only such

cases in which both types of operations were performed on the same individual, thalamotomy preceding or following the frontal lobe operation. We have 3 observations of the first and 4 of the second type. In the first group is one of our earliest cases, a woman with obsessive-compulsive neurosis in whom, following very small electrolytic lesions of the dorsomedial nuclei, there was no definite change. Two months after the thalamotomy, a psychiatrist performed a transorbital lobotomy, apparently with favorable results. However, it seems difficult to compare the effect of the 2 procedures, since the transorbital lobotomy was carried out before long range effects of the thalamotomy were established. In a second patient, a severe anxiety state (borderline schizophrenia) persisted after the thalamotomy, and also after the frontal lobotomy. The third case was a hyperactive hebephrenic woman who had shown, at the most, temporary improvement after various shock treatments. Transorbital leucotomy performed after an unsuccessful dorsomedial thalamotomy first seemed to have a beneficial effect; however, after about one month, the patient reverted to her old behavior, with delusional thinking and at times showing combativeness. A further course of electroshock treatment again induced an improvement. The time elapsed since this latter treatment, however, is too short to permit definite conclusions.

In the second group (thalamotomy following frontal lobe operations) there were 4 patients, two schizophrenics, one patient with obsessive-compulsive neurosis, and one with severe anxiety neurosis. One case was a paranoid schizophrenic who had to be reinstitutionalized because of aggressive sexual behavior, a few months after transorbital leucotomy had resulted in a transient remission. After combined thalamotomy and hypothalamotomy the patient became quieter and more manageable. In a second schizophrenic who was only temporarily relieved by frontal lobotomy, a combined anterior and dorsomedial thalamotomy was performed. In the first 2 to 3 months after this operation, improvement was not apparent; she received additional electroshock treatments. One year after the thalamotomy, the patient and her parents, with whom she lives, report that she makes excellent progress and again "enjoys everything". In view of the retarded development of the improvement it is, of course, very difficult to decide how far the thalamotomy is responsible for it. In the third patient with obsessive-compulsive neurosis, the obsessive thoughts and compulsive activity that had not been influenced by prefrontal lobotomy, subsided or were definitely reduced by the subsequent thalamotomy. A fourth patient with a severe anxiety neurosis who had relapsed after two standard lobotomies, was definitely improved by thalamotomy so that he is able to work successfully as a barber.

These experiences are not only of theoretical interest in that they point

to the importance of diencephalic systems in the mechanism of emotions, but they also seem to be of practical interest in view of the fact that the indications for the various types of psychosurgery have not been clarified as yet. It is understandable that the simplicity of transorbital leucotomy appeals to some psychiatrists. When confronted with a relapse following the latter type of operation, one has the choice between a more extensive operation on the frontal lobe, such as a standard lobotomy, and a thalamotomy. The decision may be influenced by the experience that the latter procedure is followed by much less troublesome sequelae than the prefrontal lobotomy, if any at all. In cases of relapses after extensive frontal lobotomies or lobectomies, thalamotomy seems to represent the only psychosurgical procedure that may offer some chance of improving the patient's condition.

REFERENCES

1. Spiegel, E. A., Wycis, H. T., Marks, M. and Lee, J.: Stereotaxic apparatus for operations on the human brain. Science, *106:* 349–350, 1947.
2. Garrison, M.: Affectivity in Selective Partial Ablation of the Frontal Cortex, pp. 264–282. Ed. by F. A. Mettler. New York, Hoeber, 1949.
3. Orchinik, C., Koch, R., Wycis, H. T., Freed, H. and Spiegel, E. A.: The effect of thalamic lesions upon the emotional reactivity (Rorschach and behavior studies). Life Stress and Bodily Disease. Proc. Assoc. Res. Nerv. & Ment. Dis., *29:* 172–207, 1949.
4. Miller, H. R. and Spiegel, E. A.: Sleep induced by subthalamic lesions with the hypothalamus intact. Proc. Soc. Exper. Biol. and Med., *43:* 300–302, 1940.
5. Ranson, S. W.: Somnolence caused by hypothalamic lesions in the monkey. Arch. Neur. Psychiat., *41:* 1–23, 1939.
6. Ward, A.: The cingular gyrus. Area 24. J. Neurophysiol., *11:* 13–23, 1948.
7. Bockoven, J. S. and Greenblatt, M.: The results of unilateral and bimedial lobotomy, pp. 246–253 in Studies in Lobotomy. Ed. by M. Greenblatt, R. Arnot and H. C. Solomon. Grune and Stratton, New York, 1950.
8. Glees, P., Cole, J., Whitty, C. W. M. and Cairns, H.: The effects of lesions in the cingular gyrus and adjacent areas in monkeys. J. Neurol., Neurosurg. & Psychiat., *13:* 178–190, 1950.
9. Baird, H. W., Guidetti, B., Reyes, V., Wycis, H. T. and Spiegel, E. A.: Stimulation and elimination of the anterior thalamic nuclei in man and cat. Pflueger's Arch. f. d. ges. Physiol., *255:* 58–67, 1952.

CHAPTER XXXIII

FRONTAL LOBE SURGERY

Its Value in the Treatment of Pain with Consideration of Postoperative Psychological Changes

FRANCES BONNER, STANLEY COBB, WILLIAM H. SWEET AND JAMES C. WHITE*

An account of how bifrontal leucotomy came to be used for the relief of pain has never appeared in medical literature. In 1936 Watts (Freeman and Watts, 1) operated on a woman with severe back pain which had confined her to bed for about two years. After operation she was out of bed within a few days and, although she continued to have some pain, she continued to work up until 1950. Actually she was classified as a case of conversion hysteria and it was not until 1943, when Watts performed his first leucotomy for the relief of pain, that he realized the full possibilities of this procedure (personal communication). In the meantime Van Wagenen, in 1941, had carried out the procedure in a patient with pain in a phantom limb following lower quarter amputation (hemipelvectomy) with severe narcotic and alcoholic addiction. Although relieved of his suffering and addiction, this man became such a behavior problem that he has spent most of the intervening years in a state institution, and Van Wagenen has never published the case. The first article to recommend the procedure for relief of suffering connected with non-psychiatric disease was published by Watts and Freeman in 1946 (2).

Following Watts and Freeman's publication this solution to the problem of unbearable pain has had a steadily increasing vogue. In certain painful states, such as post-herpetic and certain atypical facial neuralgias, carcinoma of the oropharynx with pain radiating to the ear, and bilateral malignant disease of the neck and upper chest, no other solution is established. In addition to its legitimate use in these conditions, bilateral frontal

* From the Neurosurgical and Psychiatric Services of the Massachusetts General Hospital, the Massachusetts General Hospital Branch of the Hall-Mercer Hospital, and the Departments of Neurology and Psychiatry, and Surgery of the Harvard Medical School.

For the work on analysis of speech, we are indebted to Mr. Paul Johnson.

This work was supported by a grant from the U.S. Public Health Service, MG 161.

leucotomy has been advocated by Freeman and Watts (3), Hawkes and Gotten (4), and Hamilton and Hayes (5) for the relief of pain in abdominal and pelvic cancer, the lightning crises of tabes dorsalis, stump neuralgia, and the pain of phantom limb. In all of these latter conditions limited interruption of sensory fibers has in our hands proven satisfactory in better than 3 cases out of 4 (6).

Although frontal leucotomy is an easier operation for the surgeon, it may not be the best treatment for the patient. The risk of operative mortality is somewhat greater than after operation on the cord, though not greater than when the pain pathway has to be cut in the medulla or mesencephalon. The danger of postoperative seizures following cortical scars in the frontal area also outweighs the possible complications from injury to descending spinal pathways. The major problem, however, that confronts the candidate for leucotomy is the psychological deterioration that follows bilateral transection of the frontal lobes. If the incision is made too far posteriorly, the damage is appalling; if sufficient frontal cortex is not disconnected from the thalamus, relief from pain is uncertain. In any event, the price that must be paid by sacrifice of certain qualities of personality, which occurs in even the modified, more limited forms of leucotomy, and the severe mental deterioration that so often follows bilateral transection in non-psychotic patients justify these procedures only in very special circumstances.

We have therefore confined our use of leucotomy to patients who have become profoundly addicted to narcotics because cordotomy, rhizotomy, or sympathectomy has been deferred too long, to the very small group in which no other solution is known, and to those with malignant disease who are haunted by fear of imminent death by strangulation or exsanguination.

In planning this paper it has seemed best to start with brief descriptions of the operation on the frontal lobes which constitute the basis for this study, with a summary of their results in regard to relief of pain and risk of surgical complications. The psychiatric evaluation of these progressively more limited procedures will then follow.

In attempting to reduce the degree of psychological deterioration we have utilized four different procedures. These consist of the original bilateral frontal leucotomy by the lateral approach, advocated by Freeman and Watts (3) (fig. 41); a modified procedure, inserting the leucotome through similarly placed trephine openings in the coronal suture but transecting only the lower frontal quadrants (fig. 42); unilateral transection of the frontothalamic connections by the superior route with suction-coagulation of the entire white matter just in front of the anterior horn of the ventricle, as recommended by Scarff (7) (fig. 43); and excision of the cortex of the

orbital surface of the frontal lobe (fig. 44). Their effectiveness in relieving pain and resultant surgical complications may be summarized as follows:

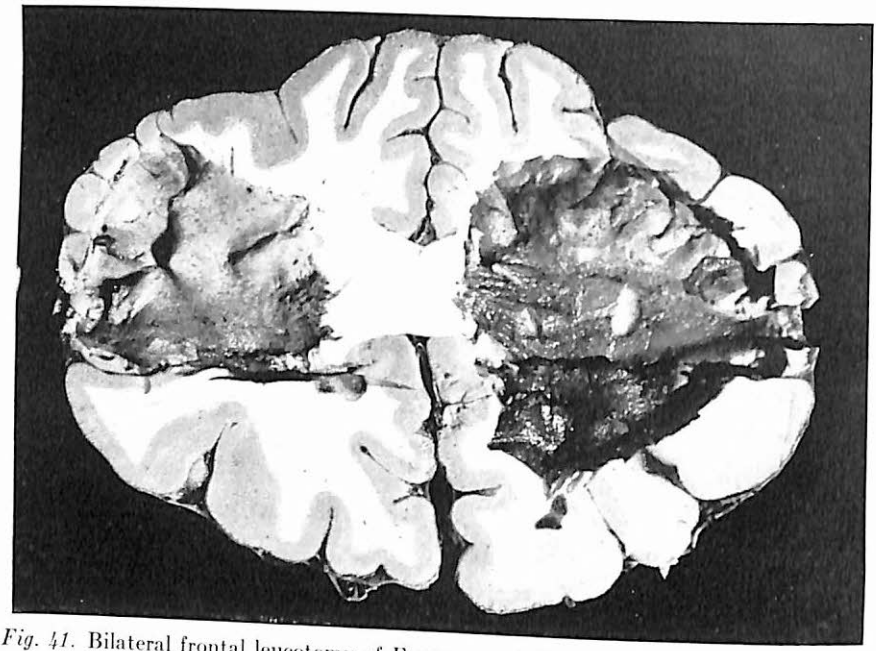


Fig. 41. Bilateral frontal leucotomy of Freeman and Watts. Leucotome transection illustrated by postmortem specimen from Case 3.

BILATERAL LEUCOTOMY OF FREEMAN AND WATTS

Five of the 6 patients who have undergone this procedure have suffered no noteworthy surgical complications (table 59). The other, Patient 3, an elderly arteriosclerotic man with post-herpetic pain, died of myocardial rupture a few hours after his operation. The 5 survivors have had satisfactory results insofar as their original pain was concerned and stopped requiring morphine in large amounts. Patient 1, with a hideous facial deformity caused by a rapidly-growing retro-orbital chondrosarcoma, never complained after leucotomy nor appeared to have any further concern about his disease. Patient 2, the only sufferer from a lower extremity phantom we have seen who failed to obtain relief after a technically satisfactory cordotomy, subsequently never referred to the pain from which he had suffered so severely following hip disarticulation for chondrosarcoma. After three or four months, when he developed pulmonary metastases, he complained of the new pain and required sedation for this and increasing shortness of breath. Yet even in the terminal month of his life, his wife, a highly

intelligent school teacher, was impressed with the effectiveness of small doses of morphine in contrast to the enormous amounts he was consuming with but little benefit prior to leucotomy. In both these men psychological

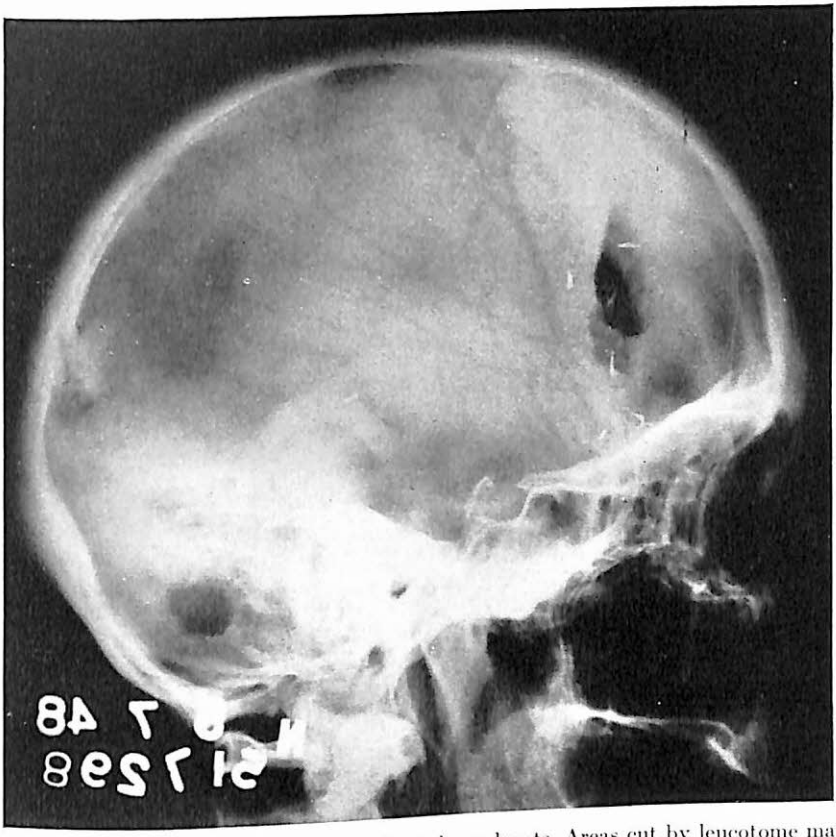


Fig. 42. Bilateral transection of lower frontal quadrants. Areas cut by leucotome marked by dural clips.

deterioration was severe, although all concerned were grateful for the relief of pain and suffering. In the last two there has been prolonged survival. The family of the fifth patient listed in the table complains that it is nearly impossible to endure him in the home, and the sixth patient has had to be committed to an institution. We have learned from these last two cases that even when bilateral leucotomy is performed in two separate stages months apart (after failure of a unilateral operation), the deterioration after the second stage is just as severe and long-lasting as when a bilateral transection is carried out at a single stage. Because of the serious psychological alterations in these individuals we have been forced to regard

Fig. 43. Unilateral leucotomy of Scarff. Position and extent of left frontal transection marked by insufflation of tantalum oxide powder.

the bilateral operation as a procedure of last resort and to explore the possible advantages of other less radical modifications.

BILATERAL LOWER QUADRANT FRONTAL LEUCOTOMY

This operation has been carried out in 9 cases (table 60). Two patients with advanced carcinoma of the lung and cervical involvement died in

coma within the first week. There were no surgical complications in the others. Mental changes, however, appeared to be nearly as severe as if the leucotome had severed the entire frontal white matter on both sides. Patient 13, the only long-term survivor, at thirty-six months remained so

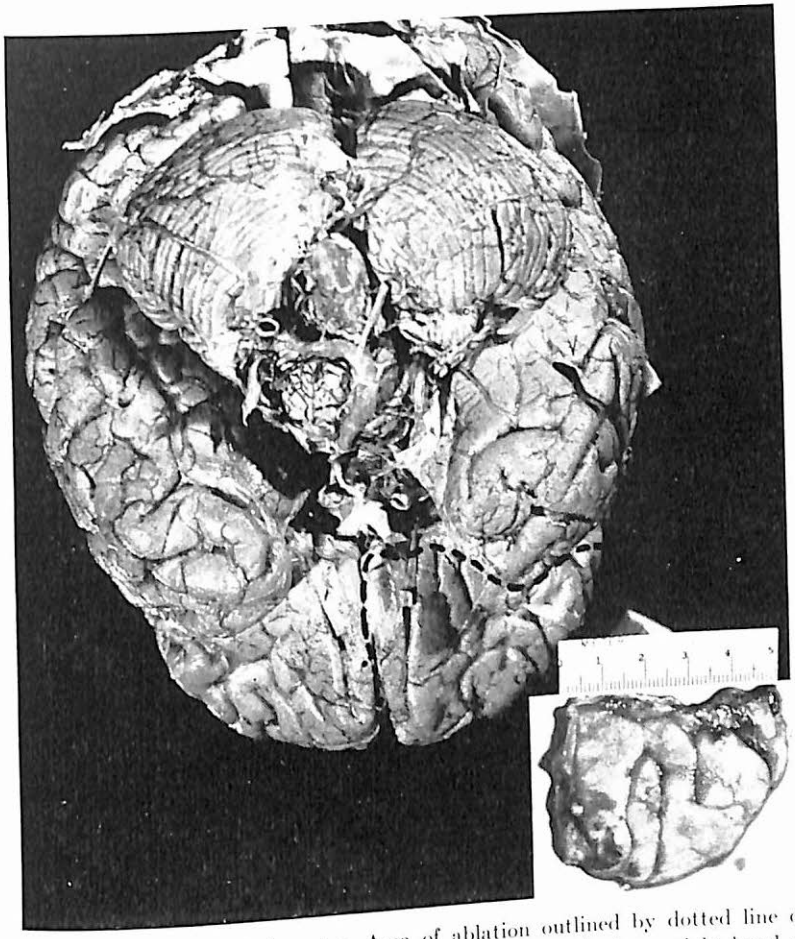


Fig. 44. Resection of orbital cortex. Area of ablation outlined by dotted line on basal view of brain and photograph of block of tissue removed. In the lower right hand corner is one of the operative specimens of right orbital cortex; on the basal view of the brain the region to which this specimen corresponds is bounded by dotted lines.

indolent and disinterested in his surroundings that he was a severe trial to his family. Although the others were neither incontinent nor serious problems in social behavior when permitted to associate with other patients on the ward, and their relief of pain and suffering was satisfactory, we soon lost all enthusiasm for this procedure because of the psychological changes that will be discussed below.

TABLE 59

Bilateral frontal leucotomies

PATIENT	DIAGNOSIS	AREA OF PAIN	RELIEF	FOLLOW-UP	POST-OPERATIVE CHANGES	
					Immediate (1 month)	Later (after 1 month)
1. Joseph D. C. MGH U-552387	Recurrent chondrosarcoma of skull and right orbit	Orbit, jaw, and ear	Complete	2½ mos. to death	Disorientation; mild paranoia; impaired judgment and insight	Improved in final month
2. Frank I. MGH U-552763	Chondrosarcoma of rt. hip. Phantom pain not relieved by cordotomy despite adequate level of analgesia	Stump and phantom foot	Pain on questioning but no longer concerned about it	5 mos. to death	Restlessness; confusion and disorientation; delusions; childish	2 to 5 mos.: childish
3. William L. MGH U-635061	Postherpetic neuralgia T3 and T4 of 2 mos. duration. Diabetes and coronary sclerosis	Upper chest and back	Pain relieved at moment leucotomy was completed bilaterally	Sudden death 2 hrs. post-op. of myocardial rupture		
4. Dominic C. MGH U-679051	Carcinoma lung with dyspnea and compression sup. vena cava	Neck, chest and abdomen	No longer aware of pain or his disease	1 mo. to death	Impaired judgment; facetious remarks	
21. Isadore W. MGH U-4731	Anesthesia dolorosa after retrogasserian neurectomy for tic	Forehead, eye and cheek	Freed of pain and morphine addiction	23 mos.	After second operation: deteriorated; in bed all day; poor social judgment; picks at nose; impaired judgment	Same at 23 mos.
27. Wylie S. MGH U-440170	Bilat. post-amputation leg phantoms not relieved by cordotomy with inadequate level of analgesia	Phantom legs	Poor	2 mos.	First operation: uncommunicative (2 days); later, difficulty thinking and remembering; loss of ambition; paranoid	
			Very satisfactory relief	18 mos.	Second operation: deteriorated; mildly confused; incontinent; masturbates; impaired judgment	Gradual improvement 6 to 12 mos. after 2nd operation; noted by wife to be at pre-op. level except that mind wanders. Relapse 15 mos. post-op.

TABLE 60

Bilateral lower quadrant leucotomies

PATIENT	DIAGNOSIS	AREA OF PAIN	RELIEF	FOLLOW-UP	POST-OPERATIVE CHANGES	
					Immediate (1 month)	Later (after 1 month)
5. Patrick R. MGH U-195609	Carcinoma floor of mouth	Jaw and ear	Good	3 mos.	Apathetic; incontinent; mildly disoriented; euphoric	Manageable; talkative; incontinent
6. Lazare G. MGH U-516682	Carcinoma tongue	Jaw and ear. Previous rhizotomy	Good	1 month to death	Apathetic; restless; mild disorientation	
7. Frank P. MGH U-594201	L. Pancoast syndrome	L. shoulder and upper chest	—	1 wk.	Coma; operative death	
8. Jacob J. MGH U-594646	Carcinoma tongue	Throat, ear and head	Good	4 wks. to death	Apathetic	
9. Wilbur L. MGH U-233175	Fibrosarcoma neck	Neck and chest 2nd operation with section of upper quadrants	Good	1 mo. then poor 9 days to death	Euphoric; loss of initiative and ambition Passive; mildly apathetic	
10. Thomas B. MGH U-517298	Carcinoma neck and pharynx	Head and neck	Good	6 wks. to death	Apathetic; uncommunicative except with great prompting	
11. John K. MGH U-519749	Carcinoma, jaw, skull, cervical nodes, lung and liver	Bilateral chest	—	4 days to death	Insufficient time for evaluation	
12. Clara H. MGH U-590298	Carcinoma mastoid	Face, ear, neck	Good	2 mos. to death	Apathetic; uncommunicative; nods; incontinent; loss of initiative; mild disorientation	Improvement at 1 month
13. Howard L. MGH U-555622	Atypical facial neuralgia	Burning in face	Good	36 mos.	Apathetic; incontinent; mild disorientation; mild confusion	Improvement with persistence of apathy; lack of ambition and initiative; self-inflicted sores

UNILATERAL FRONTAL LEUCOTOMY OF SCARFF

Nineteen patients have been submitted to this procedure on the side of the dominant hemisphere (table 61)[1]. Of these, 14 suffered from advanced malignant disease and 5 others from various neuralgias not due to a fatal condition. The only serious postoperative complication was a staphylococcus cerebritis and meningitis in Patient 14. This fortunately responded well to antibiotic therapy and her residual aphasia gradually cleared. Another patient, 29, developed postoperative seizures, which were controlled effectively by anticonvulsant medication over her brief period of survival. The early results, as far as loss of pain and suffering are concerned, have been just as good as with the bilateral operations, but when the patients have survived for longer than six or seven months the pain has returned in 4 out of 5. The solitary exception, Patient 17, remains remarkably cheerful and uncomplaining after two years, although prior to operation she was suffering unbearable burning left-sided pain following an embolism of the right middle cerebral artery. Prior to the left-sided leucotomy and psychotherapy she was so sullen and resentful that it had been impossible to help her. Fourteen months after her unilateral leucotomy she almost died from pelvic peritonitis, the symptoms of which she had neglected for six days. In view of her previous vascular accident it is possible that her right fronto-thalamic connections had already been interrupted and that she therefore has had what amounts to a bilateral operation. In relation to this woman's utter disregard of symptoms of spreading pelvic peritonitis, which nearly led to her death, the postoperative carelessness of Patient 25 led to a very tragic complication. Shortly after discharge, he attempted to fill a fuel tank with oil while smoking and burned himself to death.

Wide experience with advanced malignant disease in which pain is a major problem has taught us that relatively few patients who cannot be relieved by anterolateral cordotomy or rhizotomy are likely to survive for more than six months. Of this group of 14 only 1 (Patient 14) outlived the period in which relative comfort can be obtained from a unilateral frontal transection. This woman with an upper thoracic vertebral metastasis had a return of pain to nearly its original intensity at eight months. On the other hand, as pointed out above, there is little hope of securing permanent relief in the neuralgias in which there is no underlying fatal disease.

Contrary to Scarff's opinion, careful psychiatric examination of our patients, which will be discussed in detail below, has invariably brought out definite postoperative abnormalities. Even though these are generally slight,

[1] There is no reason to suppose that there would have been any appreciable difference had the unilateral leucotomy been performed on the opposite side, as it is the amount of frontal lobe tissue which ceases to function, more than its exact location, which seems to matter.

the patient is likely to be relieved of his pain and mental anguish only as long as they persist. There appears to have been a return of pain when psychological recovery is nearing completion.

A number of these sufferers from advanced malignant conditions admitted no pain even on direct questioning and showed no concern over death, which they realized was close at hand (Patient 22) or even any fear of imminent strangulation (Patient 32). The latter, a 26-year-old veteran with melanotic sarcoma of the thoracic outlet with superior caval obstruction, as well as tracheal compression, claimed that he was "feeling fine" a few minutes before he choked to death.

Unilateral frontal leucotomy is therefore far preferable to a bilateral operation if the individual is likely to die within a few months. Under these circumstances he may not have time to recover from the early phase of severe apathy, incontinence, and asocial behavior which is so distressing to the relatives during the first month or two after the bilateral operation in non-psychotic patients. After unilateral leucotomy these severe psychological changes are rare. If pain returns, the operation can still be performed on the second side, although at the price of serious psychological deterioration. In those individuals, however, who are not suffering from a fatal disease there is often sufficient psychological improvement over a period of months so that they can return to their families. These features, together with the greater psychological impairment that we have observed when leucotomy is performed for pain rather than for psychotic states, will be brought out in the final part of our paper, which concerns the psychiatric evaluation of these operations.

UNILATERAL AND BILATERAL EXCISION OF ORBITAL CORTEX

In 6 patients with intractable pain arising from a non-lethal lesion, we carried out removal of the cortex on the orbital surface of one frontal lobe in 5 with the hope that relief of pain might be achieved at the price of little or no undesirable mental sequel (table 62). Although the latter objective was achieved in all but the one patient with malignant tumor, no protracted useful relief of pain ensued in any patient after the unilateral operation. In only 1 of these 6 have we removed the second orbital cortex—in this case with gratifying substantial relief for seventeen months of postherpetic facial pain. The operation consists of excising *en bloc* all of the gray matter of the inferior surface of the frontal lobe in the zone delineated at the dotted line and shown in the operative specimen of figure 44. The specimens weigh from 11 to 23 grams and include very little of the white matter dorsal to the depth of each gyrus. One of the 6 patients died two months later of an unrecognized subfrontal abscess, and the patient with the two-stage bilateral extirpation of orbital cortex developed a late osteomyelitis requiring removal of both bone flaps nine months after the

TABLE 61

Unilateral leucotomies

PATIENT	DIAGNOSIS	AREA OF PAIN	RELIEF	FOLLOW-UP	POST-OPERATIVE CHANGES	
					Immediate (1 month)	Later (after 1 month)
14. Myrtis B. MGH U 445609	Metastatic carcinoma, T6	6th intercostal	Fair	11 mos.	Complicating post-operative sepsis and cerebritis. Free of pain but confused	As mind cleared, return of pain at 4 mos.
15. Eugenio Z. MGH U-564904	Carcinoma pharynx	Face, throat and neck	Good	7 mos. to death	Apathetic; no initiative	Slightly apathetic; two episodes of confusion; resumes activities—clubs
16. John D. MGH U 167727	Carcinoma floor of mouth	Tongue, jaw and throat	Good	2½ mos. to death	Apathetic; uncommunicative except by nodding; "tailoring" bathrobe	Apathetic; uncommunicative except by nodding
17. Pauline C. MGH U 617042	Atypical thalamic syndrome	Intense pain in paralyzed arm	Good	2 yrs.	Cooperative; friendly (prior to psychotherapy and operation was defiant and angry in attitude)	Defiant and angry in speech but without appropriate affect—smiling
18. Christine C. MGH U 547776	Carcinoma maxilla	Ear and neck. Unimproved by gasserian and glossopharyngeal neurectomy	Good	6 wks. to death	Affect of depression; content of speech not depressed; annoyed by small details whereas not pre-operatively	
19. Edward C. MGH U 642549	Carcinoma tonsil	Throat and mandible	Good	4 wks. to death	Speech less spontaneous; "dumb feeling"; impaired abstract thinking; loss of interest in lifetime hobby	
20. Anna T. MGH U 272589	Carcinoma antrum and ethmoid	Throat and ear (continued after retrogasserian neurectomy)	Good	6 wks.	Temporary (7 day) loss of ability to speak English; apathetic; loss of interest in family and surroundings	

21. Isadore W. MGH U-4731	Atypical neuralgia	Burning behind eye and in forehead after descending Vth tractotomy and rhizotomy	Good to poor	6 mos.	Apathetic; ate poorly	Return of pain. Second operation done. See table 59
22. Helen R. MGH U-678606	Carcinoma breast with bony metastases	Intercostal neuralgia, bilateral	Good	4 mos. to death	Decrease in spontaneous speech; flattening and dissociation of affect	-
23. Sara B. MGH U-487628	Arachnoiditis	Perineum and both legs	Fair	22 mos.	Decreased spontaneous speech; "not right in head"; lack of any feelings; "impossible to please or displease" according to husband	At 3 mos. slight return of affect. At 22 mos. increased return of affect; sits unoccupied; loss of ambition and interest
24. Christine H. MGH U-274289	Post-sympathectomy neuralgia	L. upper neck and occiput. Relief of similar r. neuralgia by previous section of spino-thalamic tract in medulla	Fair	19 mos.	Flattening of affect; restlessness; inability to express self in writing; intermittent ability to verbalize thoughts, to grasp symbolic meaning of words, to synthesize thoughts into meaningful wholes; slowed motor performance	Improvement in all categories with residual: slight flattening of affect, restlessness, slowed motor performance (twice pre-op. level), inability to perform 2 jobs simultaneously
25. George W. MGH U-287038	Carcinoma jaw	Mouth, throat and neck	Good	3 wks. to death	Less spontaneous in speech; mildly euphoric; tendency to joke; mild confusion	Burned to death 19th post-operative day
26. Peter F. MGH U-430295	Carcinoma lung	L. chest, shoulder and arm	Fair	3 wks.	Aphasic. No evaluation	-
27. Wylie S. MGH U-440170	Double thigh amputation with bilateral phantom limbs	"Thousands of needles pricking soles and feet"; bizarre variations in posture and length of phantom legs. No relief following cordotomies with incomplete analgesia	Poor	2 mos.	Uncommunicative; difficulty thinking and remembering; loss of ambition; paranoid	Second operation done. See table 59

TABLE 61—*Continued*

PATIENT	DIAGNOSIS	AREA OF PAIN	RELIEF	FOLLOW-UP	POST-OPERATIVE CHANGES	
					Immediate (1 month)	Later (after 1 month)
28. George F. MGH U 695777	Carcinoma soft palate with metastases	Constant severe pain in palate, throat and neck; suicidal depression	Good	4 wks. to death	More spontaneous in speech; apathetic and passive	
29. Ruth C. MGH U 701267	Advanced carcinoma uterine cervix with bladder and renal involvement	Bilateral high abdominal pain and severe mental depression	Good	22 days to death	Less spontaneous in speech; childish	
30. Joseph D. P. MGH U 678132	Carcinoma of palate	Mouth, neck, back and legs with dysphagia	Fair	6 mos. to death	Apathetic; little spontaneous speech; nods head to questions	
31. Mary H. MGH U 672827	Carcinoma pancreas with vertebral metastases	Bilateral in abdomen and upper back	Good	16 days to death	No evaluation	
32. Roy P. MGH U 712153	Melanotic sarcoma of thoracic outlet with compression	Upper chest and arm with fear of imminent strangulation	Good	5 wks. to death	Mildly euphoric; facetious in speech; swears; contrary in behavior at times	

second cerebral operation. This high incidence of infection is probably related to protracted studies with stimulation and electrocorticographic recording at the time of operation, and is not an inherent disadvantage of the comparatively simple procedure. One of these patients had a "control" operation—osteoplastic craniotomy with exposure of the right orbital cortex but no excision of tissue, ten months after removal of the left orbital cortex failed to help her. This second procedure was also fruitless. In the group of patients subjected to this operation an exhaustive series of studies has been carried out before and after each surgical session, and the results of these will be reported separately in detail.

PSYCHOLOGICAL OBSERVATIONS FOLLOWING FRONTAL LOBE SURGERY FOR PAIN

Here we have had the opportunity to study the effects of leucotomy and gyrectomy on individuals with pain but without psychosis. The operative procedures have been as outlined. The patients in the first two groups, bilateral leucotomy and bilateral lower quadrant leucotomy, have been seen by psychiatric consultants prior to and following operation. Those in the third and fourth groups, unilateral leucotomy and orbital gyrectomy, have had more extensive work-up which has included psychiatric consultation pre- and post-operatively with recorded interviews. We have been able to analyze, by means of these interviews, the speech of the patients pre- and post-operatively. In the work-up of the patients with orbital gyrectomies, many other studies have been done in addition and will be reported later.

Since most of the patients in all groups, except the gyrectomies, have had pain secondary to malignant disease, a long-term follow-up has not been possible. In those patients, however, whose pain was secondary to a non-malignant lesion, the follow-up has been at intervals of every one to two months following operation whenever possible.

Bilateral frontal leucotomy

Deterioration in behavior and impaired judgment seem to be the predominant features in patients following bilateral leucotomy. Masturbation, incontinence and disorientation, which at times resulted in patients getting in bed with other patients, offered a trying problem to the nurses during hospitalization and to the families during the early periods following hospitalization. Although there has been gradual improvement in these symptoms with the passage of time, in no instance has the patient improved to the pre-operative level. Two cases have been followed for 23 months and 18 months respectively.

Patient 21: This 58 year old junk dealer first entered the hospital with classic tic douloureux

TABLE 62

Removal of orbital cortex

PATIENT	DIAGNOSIS	AREA OF PAIN	RELIEF	FOLLOW-UP	POST-OPERATIVE CHANGES	
					Immediate (1 month)	Later (after 1 month)
Emma T. MGH U 442564 10 7 47 L. orbital gyrectomy	Atypical facial neuralgia cause unknown	L. face, chiefly, L. eye and L. lower jaw	None	8 mos.	Apathetic for three weeks then return to previous state. No change in Wechsler Bellevue test results	No change
S. 3 48 R. frontal craniotomy without gyrectomy			Pain stopped briefly then return to original severity	4 years	No change	No change. Pain unchanged but patient remains active.
Ernest A. MGH U 559278 11 29 47 R. orbital gyrectomy	Carcinoma of tongue with extension cervical to neck	R. base of tongue, neck, jaw and side of head	Largely relieved but returned to pre-op. intensity in r. frontal region	5 mos. to death	Irritable; threatened to strike wife; refused Wechsler Bellevue testing; many behavioral aberrations, put trousers on backwards, shoe on wrong foot, etc.; general gross deterioration	Little improvement
Florence B. MGH U 637368 3 27 51 L. orbital gyrectomy	Naevocarcinoma with exenteration of r. eye. CVA causing "thalamic pain"	R. head, face and neck L. torso and L. limbs	Partial relief for 4 mos. Return to original level in 5 mos.	8 mos.	Loss of ambition and pep; difficulty in recent memory	Slight improvement
Assunta D. C. MGH U 494	CVA causing "thalamic pain"	L. half of head, torso and limbs	No relief	2 mos.	No change noted	No change
James T. MGH U 721386 6 5 51 L. orbital gyrectomy	Traumatic total transverse lesion, upper thoracic spinal cord	Throughout lower limbs	Some complaint of original pain but required no medication	2 mos. to death from frontal lobe abscess	Slight memory loss for details	

Joseph T. MGH U 58232 1 6 48 L orbital gyrectomy	Post herpetic neuralgia	L. orbital and frontal regions	Complained less spontaneously at first; on questioning stated pain was worse. Required no medication. Then gradual relapse to previous level by 2½ years	2½ yrs	For the first 6 wks marked apathy during which time he spent most of his time in bed. This was followed by a period of extreme restlessness	Later: temporary depression. Improvement in behavior but increase in complaint of pain; loss of interest in family, friends and any form of activity
6 20 50 R orbital gyrectomy			No spontaneous complaint; on questioning, "pain not bad"	1 year and 5 mos	More sociable and friendly; interested in doing carpentry work, his hobby, for first time in 4½ years	Following osteomyelitis, had fluctuating disorientation for person, place and time; delusions of grandeur; impairment of recent memory

in the left ophthalmic division. Following trigeminal tractotomy and later, retrogasserian neurectomy, he was again complaining of pain, which was now an aching, burning pain in the left malar region and eye. This anesthesia dolorosa persisted with increasing intensity. A left frontal leucotomy was performed, following which he was apathetic and ate little, but no longer complained of pain and assumed a cheerful mien. Five months later his atypical neuralgia again became a serious problem to him and the family, and a right frontal leucotomy was performed. The following description given by his daughter summarizes changes following the second operation.

"He is considerably better than he was prior to the operation, but occasionally he complains of pain momentarily and soon forgets about it. He does not require any medication." The family feels that his memory is unreliable and that he must therefore be checked whenever asked to do anything. A typical example of his behavior occurred when he was asked to go to one of his daughters' home one Sunday to take her dinner. After about half an hour, the daughter to whose home he was going called to say that he had not arrived and that she was wondering what had happened. On going out on the front porch, the patient's family found him standing on the porch with the dinner in his hands, just staring into space. At times when the family tells the patient something, he forgets it, but may later say to them that he remembers very well the things that he has been told.

The daughter characterized her father as being very stubborn in some ways since the operation. An example of this is that he will be sitting, tapping his fingers on a chair and the family will ask him to stop, but he will persist in doing it. Occasionally when they ask him to do something he will refuse to do it. At other times, however, he will comply with their wishes even though the thing they ask might be the same thing he previously refused to do. He has been noted to pick at things with his hands a great deal since the operation; this includes picking at his nose. On many occasions he has picked at his nose until it bled. This seems to happen most often when he is picking at the left, or anesthetic side. This is frequently annoying and embarrassing to the family. He appears, and complains of being, very tired most of the time and frequently goes around the house groaning, complaining of his fatigue, particularly in the morning. If left alone, he will sleep until very late in the day, then after getting up will stay up for a few hours and go back to sleep. At other times his family will find his behavior quite amazing. One night before going to bed, and without being told, he went around the house checking all the doors to be sure they were locked. Prior to the operation the patient was quite concerned about money and would frequently ask his son about the five or ten dollars owed him, whereas since the operation he never bothers to ask about the money and does not seem to be concerned about its repayment. He is not concerned about his business and never expresses any desire to return to it. The daughter feels that the family does not wish him to return to his business as he is a peddler and works alone and they do not feel that he could be trusted with handling money.

Patient 22: This 61-year old male entered the hospital with a diagnosis of bilateral phantom limbs and pain of six years' duration. Prior to this accident which resulted in the loss of both lower limbs, the patient had wandered around from job to job. Following the accident, he remained at home, where the situation with his wife became increasingly strained, as he would invite groups of men to the home to drink and play cards. Following these bouts of drinking, the patient would become "crazy and wild" and, as a result of his behavior, the wife refused to allow liquor in the house and the men stopped coming to see the patient. The patient then became quite sullen and withdrawn, demanding more and more medication and showing strong paranoid tendencies. He remained in bed a large part of the time and was sexually very demanding of his wife. On occasional days when he was supposedly in too much pain to get out of bed, the wife would come home to find an "X" on the furnace in the cellar, this being the patient's way of letting her know that he could still get around. On one occasion

he threatened her at gunpoint. These periods of difficult behavior most frequently came after he had been receiving large doses of narcotics which the patient maneuvered from the local doctors.

Following a left leucotomy, the patient was almost totally uncommunicative during the first two days, although he was conscious and not aphasic. By the 7th post-operative day he would again communicate well but noted that he had difficulty in thinking and remembering. This gradually improved, and, later, in describing his immediate post-operative state, he noted the fact that he was "in a fog" and that only around the 20th post-operative day did he seem to be coming out of it. He recalls little of what went on while he was in the fog except that he had severe phantom limb pain. On coming out of the fog he noted that he was "changed" and that he felt low in spirits. He had no ambition at all; the opposite to the way he usually felt. Further questioning revealed that while he was in the fog he felt completely withdrawn and had the feeling that all the doctors and nurses were accusing him of homosexuality and of making homosexual advances to the orderlies. During this period he had a dream in which he was a partner in a homosexual affair.

There was gradual improvement in the patient's status in that he was able to care for himself, would sit up a fair part of the day and eat his meals with the other patients, no longer felt that the doctors and nurses were against him. He noted, however, that he did feel "odd" compared to the other patients. As his mental status improved he complained more of the pain, eventually noting that it was as bad as prior to the operation.

Following a right leucotomy, two months after the left, the patient's behavior markedly deteriorated in that he would spend most of his time staring out of the window, was frequently incontinent of urine and feces, talked circumferentially, was slovenly in his dress and would masturbate freely.

Because of the deterioration in his behavior, the patient was sent to a State Hospital. Here, there was a gradual improvement over the next 14 months. A letter from his wife, a nurse, 8 months post-operatively reports: "Since you went out (to State Hospital) with me, I have been there several times. I stayed at least two and one-half hours each visit and I watched everything. My opinion is that his brain pattern has grown back to practically where it was before the lobotomies. He can be very charming when he wants to be, and he generally wants to be when I am there, but he also is extremely disagreeable to the orderlies or patients who cross him in any way or annoy him at all. He is not at all sociable as he speaks to only one man. The two sit together and will not speak to anyone except to be sarcastic. He never asks for anything. He tells me he still has the original pain and it is no use in telling anyone there for they would do nothing about it."

A later report from the wife revealed that he seemed to be back to his preoperative personality except that he did not seem to remember things she told him or seem interested in any subject. His attention would wander.

Fifteen months post-operatively the patient had an episode of unconsciousness (etiology unknown) lasting several hours, since which time his behavior has become similar to that immediately after the second operation. He is incontinent, complains of pain in the legs, eats little, has no interests and has little to say to anyone.

Bilateral lower quadrant frontal leucotomy

Marked apathy in each patient, except one, seemed to be the predominant feature of the lower quadrant leucotomies. One patient following the operation was noted to have been euphoric. In addition, incontinence, mild disorientation, uncommunicativeness except by nodding, and decrease in initiative and ambition were noted.

Patient 13 has been followed over a period of 36 months. The following quotation from a recent letter from his wife summarizes the late results seen in this patient:

"He sure is a problem. He doesn't do a thing all day but sits in his chair and dozes off a lot. Is like a balky horse, he won't do a thing he doesn't want to. Half the time he won't even put his stockings on and sits and rubs his fingers up and down his ankle. He has a sore on his nose and he picks at that all the time. Every other thing his face will bleed and run down his face all over everything. He told the fellow at the barber shop where he goes he wished he never had it done, but never told us so here at home. I try so hard when the weather is nice to get him to take a walk outside but he won't."

Unilateral frontal leucotomy

In general the changes most frequently noted following unilateral leucotomy are a decrease in spontaneous speech and flattening of the affect. In 4 instances inappropriate affect was noted. Other findings included impaired abstraction and euphoria. In one case (Patient 23) there seemed to be a total lack of affect for three months. In the 3 cases followed for 2 years, 22 months and 19 months respectively there has been a gradual return psychologically towards the pre-operative level, though in no instance has the pre-operative level been obtained.

Patient 17: This 28-year-old female entered the hospital with the chief complaint of severe pain and spasm in the left hand, arm and shoulder of 4 months' duration. Present illness revealed that she had rheumatic fever since the age of 5, having had multiple emboli from which she had made a complete recovery until the onset of painful spasm of the left hand and arm.

Prior to her transfer to the psychiatric service, she showed a querulous, hostile, angry despair. She was overtly very hostile towards all of the doctors and nurses except one neuro surgeon. She questioned the motives of most of the people who looked after her and was very demanding. Following a period of psychotherapy, a considerable change was brought about, and, although she remained somewhat angry and defiant, her defiance was shifted to her disability rather than to those caring for her. She became more cooperative, hopeful and accepted the idea of leucotomy.

A right unilateral leucotomy was performed following which the patient was cooperative, friendly on the ward, and, while she did not deny that her pain existed and occasionally troubled her, she was not distressed and appeared able to stand the pain. After operation she was up and about, mixed freely with the other patients and was able to live and sleep without medication.

When seen 5 months after operation, the patient was free of pain except in the middle phalangeal joints of the fingers of the left hand. She noted that she was irritable and would fly off the handle frequently. She constantly complained that her condition was unbearable and that the orthopedic surgeons had promised to operate on the hand and that she was going to do something (implying suicide) if the doctors did not hurry and get a bed for her so she could be admitted to the hospital. Although very complaining and desperate in her words, her affect was dissociated, and she was very pleasant, smiling and appeared fairly comfortable.

Following another embolus to the brain 21 months post-operatively, the patient became totally free of pain and stated subsequently that, "I've never felt so good in all my life."

Patient 23: This 59 year old female entered the hospital because of intractable pain in the

rectum and both legs of nine years' duration. A series of three laminectomies failed to reveal any lesion other than an arachnoiditis. A right anterolateral tractotomy resulted in temporary relief of pain with a later return of rectal burning and some weakness and numbness of the left ankle and foot.

Prior to the onset of her illness, the patient, mother of 2 children, had been an extremely active person. She described herself as being "constantly on the go". During a routine day she would usually get her housework done, following which she would go in town for lunch and go to the movies. At night she and her husband would frequently go visiting or have friends in. During her earlier life she had devoted her time to her home and her children. Following the onset of pain she persisted in her home and extra home activities and describes how frequently going into town the pain would be so severe that she would have to stop wherever she was and sit down until it would be relieved. During the past year, because of the intense pain, she had been unable to go out and spent most of her time at home watching television and doing other things that could be done while sitting down. She described the pain as a burning pain in the rectal and vulvar regions and a pulling pain which extended down into the legs.

When seen following a left unilateral leucotomy, the patient noted the fact that she was not "right in the head" but could not describe the difficulty further. Her response to practically every question was "I don't know", and one had the impression that actually she did not know how she was feeling or whether or not she had pain. She was able to tell about the visitors she had but showed absolutely no feelings or affect about any of the things that had happened. During this period, in addition to being apathetic and without interest in anything going on around her, the patient at the same time showed a good deal of restlessness which was characterized by her moving her hands in a purposeless fashion, picking at her bandage or shifting her position in her chair.

Following her return home on the 10th post operative day, her husband noted that this state persisted and he found it very disturbing. The patient would spend the entire day just sitting and at night would watch the television without making any comment or expressing any likes or dislikes for the program she was seeing. He noted that it was "impossible to find anything that would please or displease her".

Three months post operatively her husband noted that the patient had begun to show signs of anger; e.g., when she would ask that he bring something home and he would forget to do so. He was greatly pleased at this return of affect.

To date, the patient has shown a great increase in affect, though not to the pre-operative level. With return in affect, there has been a return of the pain, which at present the patient describes as being as severe as pre operatively. She enjoys visits of friends and family for short periods of time. She spends practically the entire day just sitting and looking out of the window and not engaged in conversation. She complains of not being able to interest herself in anything, particularly when she is alone.

Patient 24: This 26 year old female with severe Raynaud's disease in both upper extremities had been treated by the Peripheral Vascular Clinic in 1945 with bilateral upper thoracic preganglionic sympathectomies through the retropleural approach. On account of recurrent vasospasm sympathetic denervation was repeated three years later by extensive resections of the decentralized stellate ganglia and the areas of retropleural scar at the sides of the second and third thoracic vertebrae. These procedures on the right and left sides were carried out in two stages through the transthoracic route. The patient then began to complain of persistent pain which was unbearably severe in the right upper chest and shoulder. Although this pain was effectively relieved by an anterolateral cordotomy at the first cervical level, she was still incapacitated and addicted to narcotics by increasing neuralgia on the opposite side. Because of our reluctance to attempt bilateral cordotomy at such a high level it was decided to try a left frontal leucotomy. At the time of hospitalization for leucotomy the residual pain on the

left side was very severe, beginning in the fingertips and migrating up the inner aspect of the arm to involve the axilla, shoulder, left chest and, occasionally, the left torso and lower limb. Prior to hospitalization she required Demerol twice a day but failed to respond to any other medication.

The patient was born in Massachusetts and denied any childhood habit disorders except for nailbiting, which has persisted to the present, and a poor appetite with occasional episodes of vomiting. During her childhood she was in numerous foster homes, coming home at times to live with her mother and step-father. She never got along well in any of these places since she "didn't seem to fit in". She completed high school at the age of 17, allegedly without difficulty although during that time she was frequently sick for a week at a time with episodes of weakness, nausea and vomiting, and once, at the age of 15, while carrying an illegitimate child. She states that she was raped at this time while on a blind date. She married at 17 but was soon separated from her husband when she discovered that he was previously married and had not been divorced. Impressive in the patient's history are the inconsistencies in her story as given from one time to the next. She notes that at times she has deliberately lied and feels that she cannot trust anyone, "even doctors".

During the pre-operative period, the patient talked along freely in interviews, noting, however, from time to time, that although she was comfortable in talking she did not know when she might suddenly stop talking or leave the interview because something would happen – she did not know what. At times during the interview she would have difficulty remembering. This difficulty seemed to have been a circumscribed amnesia for certain details, particularly dates. "I mean I'd try to puzzle it (dates) out for an hour. Nothing comes to me at all. Just like a blank. I know what operations I've had, and I know what floor I was on and what doctor operated and things like that, but as far as actual dates are concerned, I can't seem to remember that."

Following the left unilateral leucotomy there were no gross changes in memory or personality. There was a flattening of affect both objectively and subjectively. For example, in describing the visit paid by her mother and little brother, the patient noted: "I wasn't overjoyed at seeing them. I mean I passed the time of day away with them and that's all there was to it. If I was being hurt or pleased or anything there just wasn't anything there." Frequently during the interview she would note that she was not able to explain what she meant. For example: "I don't know how to explain it at all (when asked how she usually felt when her mother came to visit). I mean it's gotten words, it's got to have words, but how to explain it, I don't know. And I've tried to puzzle it out but I just can't so I forget about it. A lot of other things I just forget about and somebody else puzzles them out for me. That way I just know the answers and I just don't let on." Further, the patient stated that she had been very disturbed in attempting to write a letter to her sister. Having gotten as far as "Dear Miriam", then, knowing what she wanted to say and proceeding to write, she suddenly realized that nothing was written on the paper except a series of "G's" and "Y's" interspersed with a few "N's". She quickly erased this and tried again, but she found that although she knew what she wanted to say, only these letters would come out. In regard to reading or listening to others talk, she noted that at times it would make sense and at other times it sounded like a jumble of words without meaning. After having heard a conversation she would frequently go over it in her mind and begin analyzing it to find that it had been a jumble of words and that it was actually senseless.

On the 10th post operative day, the patient was due to go home, but, because of a slight elevation in temperature, she was forced to remain in the hospital. When seen on this day, she expressed a good deal of concern and mild anger about the fact that the doctors would not allow her to go home, but more specifically because they did not tell her the reason she could not go. In discussing this further, the patient finally said, "If they're telling the truth (meaning

if her temperature was elevated) well, that's all there is to it." Doctor: "Do you feel that they might not be telling the truth?" Patient: "I don't know. I always read the thermometer before I give it back and so . . . I mean . . ." Doctor: "What has the reading been?" Patient: "Well they still take it rectally and it's almost 101 this morning." Doctor: "Is there some way, then, in which they are not telling the truth?" Patient: "Well, they seem to be telling the truth, I guess."

From the above and similar conversations with the patient it appeared that although she had all the facts in a given situation, nevertheless, she was unable to relate them to each

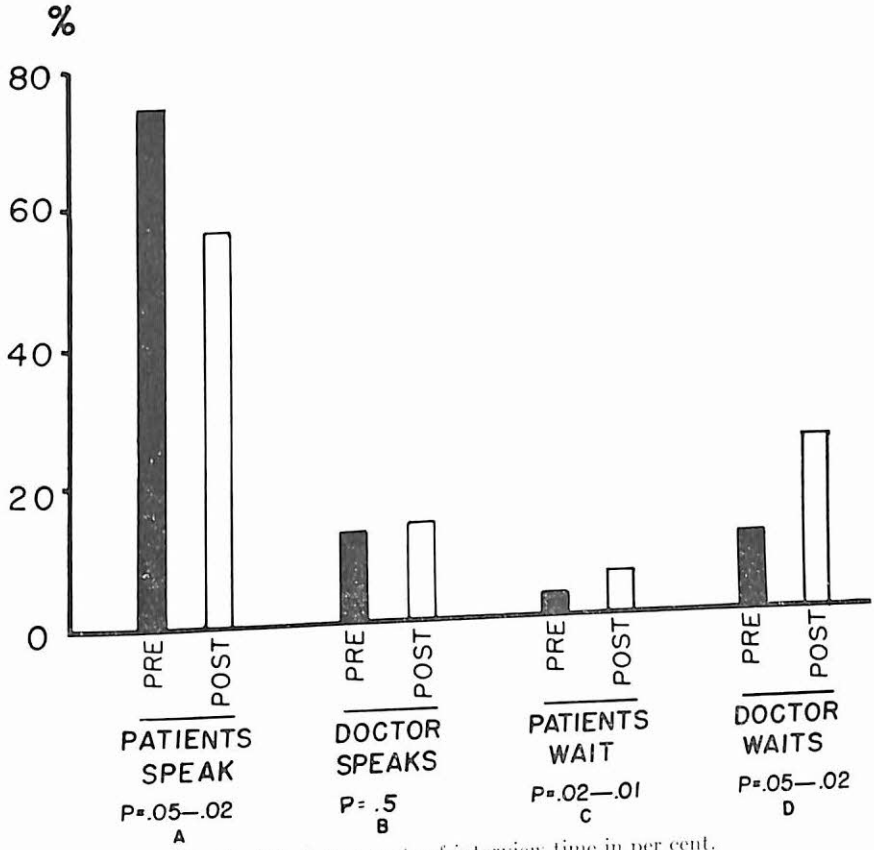


Fig. 45. The larger parts of interview time in per cent.

other in a meaningful way. Following the operation the patient's pain was improved and she noted, "The actual nature of the pain has changed, but the pain is still there. It's in the same area, except it isn't as strong." On returning home, she found that she was markedly slowed down so far as her ability to perform household tasks was concerned. An example of this is the fact that she noted it would take her three hours or more just to clean the stove, or that it would take her all day to clean her room. This was due to the fact that it was necessary for her to think of each step separately, or, if she did not, and permitted her mind to wander, she would find that she had dusted the same spot for five minutes. In addition to this, she noted that she found it very, very difficult to remain in the house, that she had a constant desire to go out and just walk the streets, not going any place in particular. At times she

would find herself in various places, not knowing how she got there and not having recognized any particular scenery along the way. She further noted some impairment in memory in the sense that she found it impossible to remember what the houses on her street looked like although she saw them every day and had for many years.

The patient continued to take large doses of medication although she noted that her pain was better. The operation seemed to have had no effect so far as her addiction was concerned.

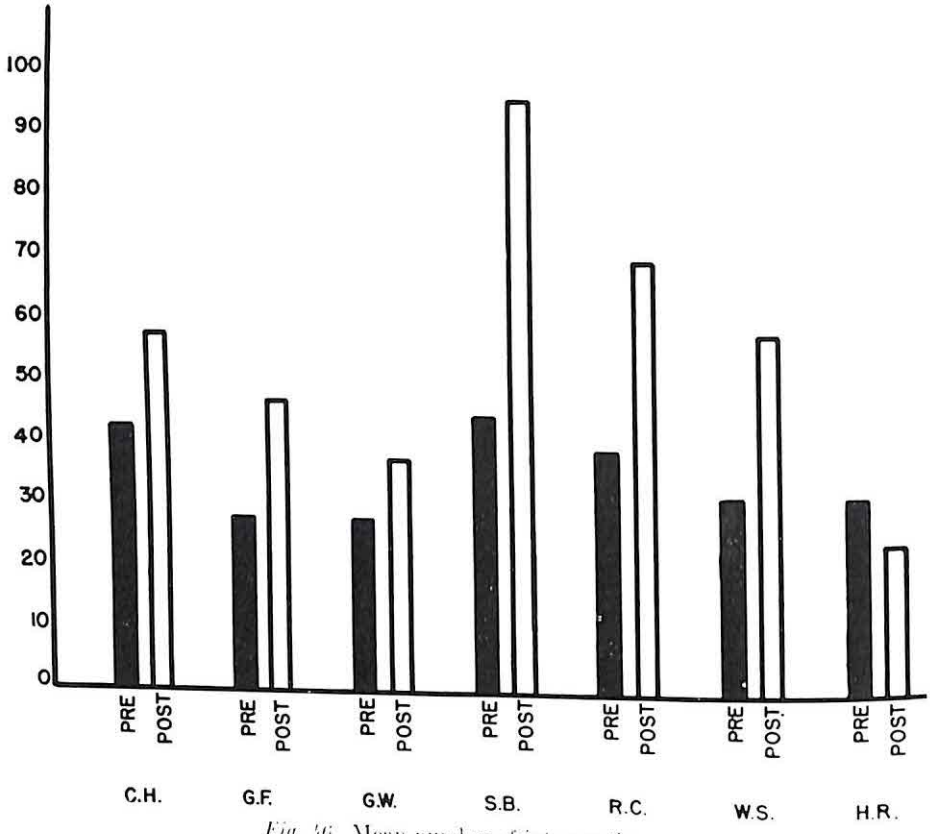


Fig. 46. Mean number of interventions.

There was gradual improvement in each of the above described difficulties and after three to four months her inability to express her feelings in words, her inability to put thoughts in writing, her intermittent loss of the symbolic meaning of words, and her inability to synthesize thoughts into meaningful wholes, had completely disappeared. A slight flattening of the affect has persisted to the present. In addition, the patient notes the fact that at present she is still restless, and it may require twice as long to do things as prior to the operation.

Six months following her leucotomy, a spino thalamic tractotomy was done at C_2 on the right which resulted in alleviation of the pain.

Speech analysis pre- and post-unilateral leucotomy. It was possible to analyze the recorded interviews of 7 patients pre- and post-operatively. Analysis of the larger parts of the interviews (the patients' speaking time,

the doctor's speaking time, the patients' waiting time before responding to the intervention or prodding of the doctor, and the doctor's waiting time before intervening) reveals, as seen in figure 45, a drop of 18 per cent in the patients' speaking time following operation and an increase in the waiting time (the interval between the doctor's intervention or prodding and the patients' speaking).

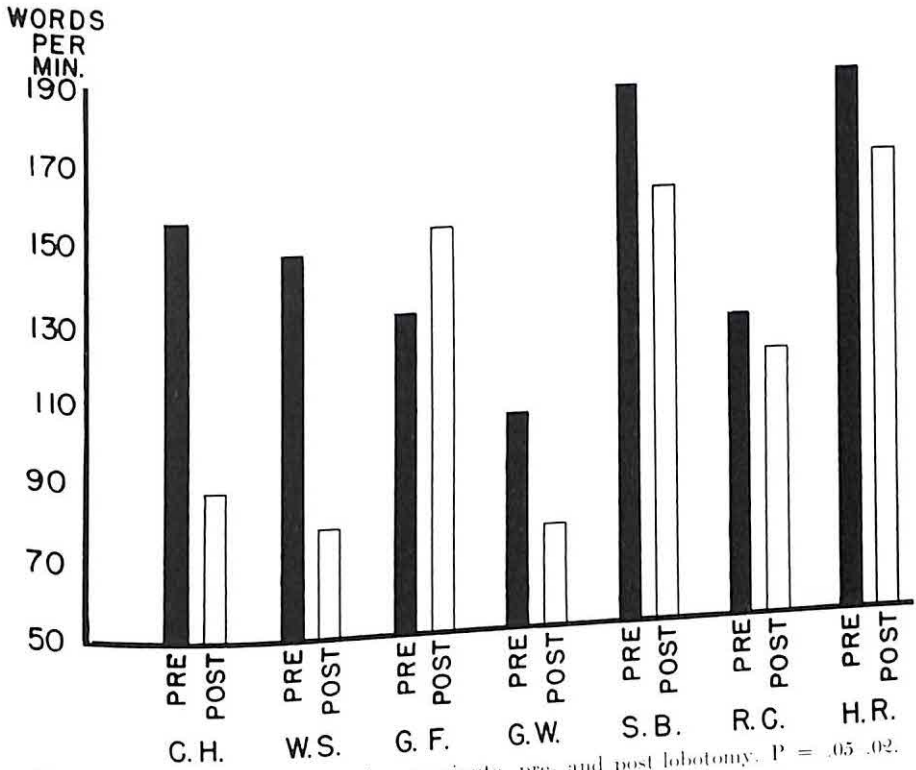


Fig. 47. Rate of speech in words per minute, pre- and post lobotomy. P = .05 .02.

As was shown in figure 45, the per cent of doctor's speaking time showed no appreciable change, but figure 46 indicates that there was a significant increase in the number of interventions (significant at the 2 per cent level). This seems to indicate that the patients' lowered responsiveness made the doctor increase the number of interventions in order to "draw the patient out".

Figure 47 gives the rate of speech in terms of mean words per minute for each patient before and after unilateral leucotomy. In every case, except that of G. F., there is a decrease in the rate of speech flow after operation. The group mean pre-operatively was 143.8 words per minute and post-operatively it fell to 118.2. This was found to be significant at the 5 per cent level.

In summary, 16 pre- and 19 post-leucotomy (unilateral) recorded interviews on 7 patients were analyzed. The tendencies noted post-operatively were that the patients speak less during interviews, the rate of speech in words per minute is reduced and the patients take longer to respond to the doctor's interventions.

THEORETICAL DISCUSSION

In important studies of the psychological effects of frontal leucotomy performed for the alleviation of pain, Watts and Freeman (8) and Koskoff, Dennis, Lazovik and Wheeler (9) make the convenient distinction between *suffering* and *pain*. They emphasize that frontal leucotomy is surgery for the relief of *suffering* rather than for the relief of *pain*. In order to understand suffering, one must have a comprehensive knowledge of the patient. In treating suffering a complex entity, the personality, is being attacked therapeutically. In Koskoff's paper the concept of suffering, whether the pain is described as a sensation, a perception or an emotion becomes academic. They conclude that: "The relief of suffering may be achieved as a result of the interruption of association pathways forming part of a vicious circle. Organic irritants activating long-circuiting afferent impulses allow for the bombardment of internuncial pools at frontothalamic levels. Psychic irritants with eventual somatic effect may bombard the same areas. Frontal leucotomy surgically interrupts the association pathways in this circle."

Here is a neurological explanation of the effects of leucotomy. It brings in the concepts of association paths, long-circuiting and vicious circles. For an hypothesis to explain the relief of suffering by frontal gyrectomy or leucotomy, the concept of long-circulating seems to be basic. It was implicit in Sherrington's work on the integration of the nervous system, and, as far as we know, was first mentioned in print by Fulton in 1926 (10). One of us took it up and applied it to the idea of human intelligence in 1936 (11) and later to explain the effects of leucotomy (12). Freeman and Watts (1) consider it a useful explanation for the effects of "psychosurgery". The concept may be summarized, in a simplified mechanistic explanation, as follows:

A sensory stimulus is received in the thalamus and relayed to the appropriate cortical sensory area; it then spreads over many associative fibers to other neighboring areas, awaking old associations and arousing responses conditioned by past experience. Eventually these spreading stimuli are gathered in from their long-circuiting and projected onto the motor areas, to be transformed into motor acts. In short, the crude sensory stimulus arrives in the subthalamus and thalamus and is relayed to the cortex. Here it is widely spread so that former conditionings are aroused, and finally the stimuli converge on the motor cortex and are expressed in motor behavior.

The greater the long-circuiting through association areas the greater is the conditioning of the response. Reactions are delayed and modified by past experience. The more one acts in the light of experience, the more intellectual is the response. The ability to "look ahead" and act "intelligently" is the great asset of man. No other animal can do this to any important extent.

Since Koskoff et al. wrote their paper in 1947, some important theories have been promulgated that enhance the importance of the neural circuit, benign and vicious. Wiener's "Cybernetics" (13) in 1948 put together facts, taken from the field of communication engineering, concerning the switching devices, electronic circuits and feed-back of the modern calculating machines. These may well make a mechanical model that has important analogies with the mechanisms of the human cerebrum (14). Much is known now about the neuronal circuits between thalamus and cortex (15). The essential mechanism, from the physiological point of view, is an arrangement of neurons that can keep up a sustained state of activity following a few intermittent stimuli. For this the mechanism sketched in figure 48 is admirably suited. The tract from hypothalamus to thalamus tends to keep the latter awake and ready to receive the impulses from cord and brain stem. The neuronal circuits from thalamus to cortex and back supply the mechanism for sustaining a stimulus by reverberation, once the thalamus has been stimulated.

Of great interest also is the neurological mechanism of emotional reaction proposed by Papez (16) in 1947, but only recently taken up and elaborated by others (17, 18). In this concept of the neurology of emotional phenomena, the archicortex and mesocortex (see fig. 49) are taken together and described as the old "visceral brain" in contradistinction to the neocortex. This visceral brain is largely the cerebral area that used to be called rhinencephalon, and comprises hippocampus, amygdala, uncinate gyrus, cingulum and the posterior parts of the orbital gyri of the frontal lobe. The olfactory organs are, of course, included and form an important element. Every sentient human being has experienced the close relationship of smell to emotion. The neocortex is largely integrated with the thalamus by the thalamocortical circuits (fig. 48). The visceral brain receives impulses not only from the olfactory bulb, but from the other sensory tracts as well (19). These are integrated in the hippocampus. The visceral brain is thus activated and adds its background of emotional feeling to the total reaction. It discharges largely into the hypothalamus, thus setting up autonomic reactions in the vessels and viscera. A tract from areas 12 and 13 in the orbital part of the frontal cortex may be a link between the neocortex and the visceral brain (20).

One can conceive of a great many neural circuits in these combined

mechanisms. In both old and new parts of the cerebrum the circuits are activated by sensory nerve impulses of many kinds, their activity continuing long after the activating stimuli have ceased. That sensory stimuli do spread to many areas by associative pathways is well known. That sensory stimuli are stored as memories is also common knowledge. The phenomenon of the phantom limb is probably a complex sensory memory stored in the central nervous system where there is considerable integration of neurons.

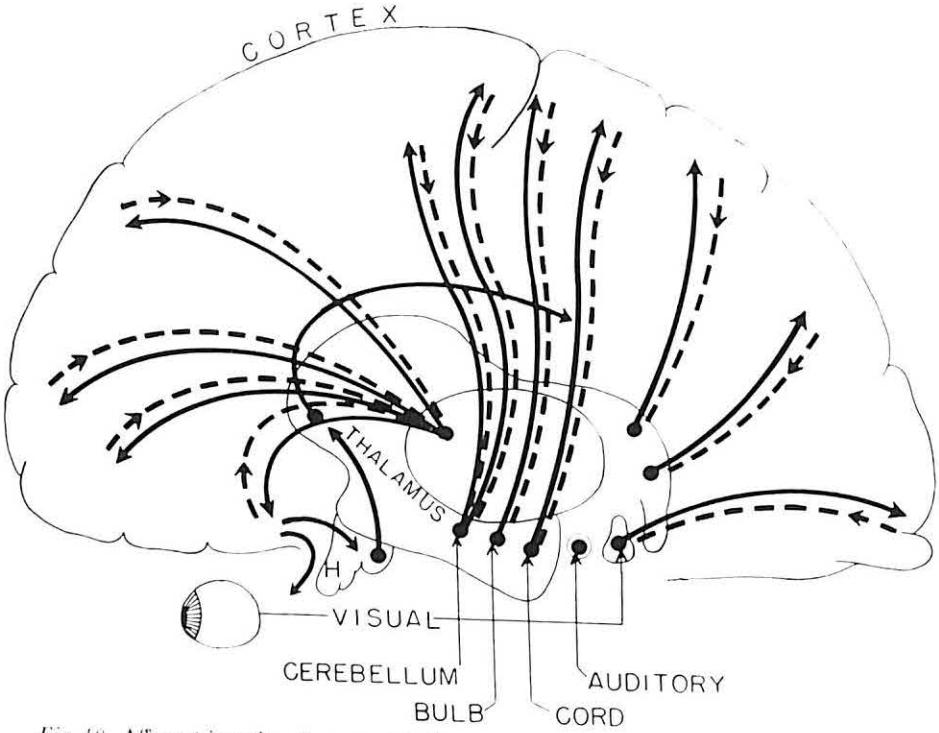


Fig. 48. Afferent impulses from cord, bulb, ear and cerebellum have relays in the thalamus; the thalamo-cortical neurons are paralleled in most cases by cortico-thalamic neurons, there being reverberating circuits from diencephalon to cortex.

To apply all this to painful stimulation one has merely to think of the stimulus as greatly increased. The levels of receptor end-organ, sensation, perception and emotion, may be thought of as levels of increasing complexity of the central nervous system to which the stimulus ascends, with more and more associations aroused and different neuronal circuits activated. The total effect on any one brain of a strong sensory stimulus may be small or great, important or insignificant, according to the life history of that especial brain. A moderate pain might cause and perpetuate much suffering because of widespread activation of the cortex.

The theory justifying leucotomy is simply that a reduction in the number of activated circuits may reduce the abnormal activity enough to give relief. This is the quantitative aspect. In addition is the probability that after a cerebral wound, re-integration must take place. The whole cerebral mechanism organizes itself to go on functioning in the new *Gestalt* and at a somewhat less complex level. During this period of re-integration it may be that some functions are lost for a period, a possible explanation of the temporary dysfunction seen after unilateral leucotomies for five or six months. Finally

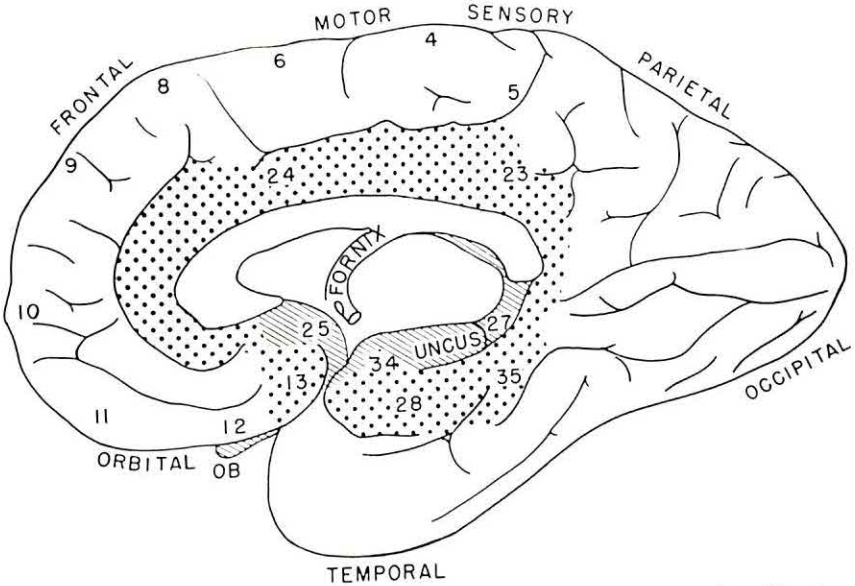


Fig. 39. Areas of neocortex surround and overlie the mesocortex and archicortex, or "visceral brain."

it may be that cutting specific tracts is important. For instance if the connections between neocortex and archicortex were severed one might speculate that there would be less activation of the archicortical circuits which probably subserve emotional reactions and thus perpetuate suffering. This gives a rationale for the orbital gyrectomies and lower quadrant leucotomies.

There is not good explanation of the observation that patients leucotomized for pain seem to suffer much more mental deficit than those leucotomized for psychosis. One might speculate with Wiener (13) that it is because the psychotic patients are usually agitated or obsessive, and their relief comes from the reduction of activity by cutting out already overloaded circuits. Thus the psychotic patient is reduced from hyperactivity to a normal level, whereas the patient with pain has his cerebral circuits reduced from a more normal to a subnormal status.

SUMMARY

1. The results in terms of the relief of pain following bilateral leucotomy, bilateral lower quadrant leucotomy, unilateral leucotomy and orbital gyrectomy are described.

2. Following bilateral leucotomy in six patients severe psychological changes were noted which consisted largely of deterioration of the patients' behavior and impaired judgment. These were most severe immediately following operation, improving with the passage of time. Two patients, followed for 23 and 18 months, are reported.

3. Following bilateral lower quadrant leucotomy in nine patients apathy was the predominant feature noted immediately post-operatively, and, although there was improvement with the passage of time, in the one patient followed for 36 months, it was still a predominant feature.

4. Following unilateral leucotomy in nineteen patients the psychological changes noted were on the whole slight in degree and, as with the previous groups, improved with the passage of time. The changes most frequently noted were slight flattening of the affect, inappropriate affect, decrease in the amount of spontaneous speech, decrease in the rate of speech in words per minute and increase in the time interval prior to responding to the interviewer's questions. Three cases, followed for two years, 22 months, and 19 months, are reported.

5. A preliminary chart is included on six patients showing the major changes following unilateral and bilateral excision of the orbital cortex.

6. Patients leucotomized for pain seem to suffer more mental deficit than those leucotomized for psychosis.

7. A theory is promulgated to explain the neurophysiological effect of leucotomy in reducing pain.

REFERENCES

1. Freeman, W. and Watts, J. W.: Psychosurgery: Intelligence, Emotion and Social Behavior Following Prefrontal Lobotomy for Mental Disorders, 337 pp. Springfield, Ill., Charles C Thomas, 1942.
2. Watts, J. W. and Freeman, W.: Psychosurgery for the relief of unbearable pain. J. Internat. Coll. Surg., *9*: 679–683, 1946.
3. Freeman, W. and Watts, J. W.: Pain mechanisms and the frontal lobes; a study of prefrontal lobotomy for intractable pain. Ann. Intern. Med., *28*: 747–754, 1948.
4. Hawkes, C. D. and Gotten, N.: Prefrontal lobotomy vs. cordotomy for relief of intractable pain. Tr. Amer. Neurol. Assn., 208–210, 1948.
5. Hamilton, F. E. and Hayes, G. F.: Prefrontal lobotomy in the management of intractable pain. Arch. Surg., *58*: 731–738, 1949.
6. White, J. C., Sweet, W. H., Hawkins, R. and Nilges, R. G.: Anterolateral cordotomy: Results, complications and causes of failure. Brain, *73*: 346–367, 1950.
7. Scarff, J. E.: Unilateral prefrontal lobotomy for the relief of intractable pain. J. Neurosurg., *7*: 330–336, 1950.

8. Watts, J. W. and Freeman, W.: Frontal lobotomy in the treatment of intractable pain. Res. Pub. Assoc. Res. Nerv. & Ment. Dis., *27:* 915, 1948.
9. Koskoff, Y. D., Dennis, W., Lazovik, D. and Wheeler, E. T.: Psychological effects of frontal lobotomy performed for the alleviation of pain. Res. Pub. Assoc. Res. Nerv. & Ment. Dis., *27:* 723, 1948.
10. Fulton, J. R.: Muscular Contraction and the Reflex Control of Movement, 644 p. The Williams & Wilkins Co., Baltimore, 1926.
11. Cobb, S.: A Preface to Nervous Disease, 173 p. The Williams & Wilkins Co., Baltimore, 1936.
12. Cobb, S.: Borderlands of Psychiatry. Harvard University Press, Cambridge, 1943.
13. Wiener, N.: Cybernetics, p. 194. J. Wiley and Sons, New York, 1948.
14. von Foerster, H., ed.: Cybernetics, 249 p. Josiah Macy, Jr. Foundation, New York, 1951.
15. Brazier, M. A. B.: Electrical Activity of the Nervous System, 220 p. Macmillan & Co., New York, 1951.
16. Papez, J. W.: Proposed mechanism of emotion. Arch. Neurol. & Psychiat., *38:* 725, 1937.
17. MacClean, P.: Psychosomatic disease and the "visceral brain". Psychosom. Med., *11:* 338, 1949.
18. Cobb, S.: Emotions and Clinical Medicine, 243 p. W. W. Norton & Co., New York, 1950.
19. Brodal, A.: Hippocampus and the sense of smell. Brain, *70:* 179, 1947.
20. Ward, A. A. and McCulloch, W. S.: Projection of the frontal lobe on the hypothalamus. J. Neurophysiol., *10:* 309, 1947.

SUMMARY OF PAPERS XXXI TO XXXIII

J. LAWRENCE POOL, *New York*

I have been requested by the Commission to make a brief summary and open the discussion of these extremely interesting papers.

First of all, I should like to congratulate these authors for their studious and careful work, their imagination, and superb surgical technique.

Turning first to Dr. Livingston's paper on isolation of the anterior cingulate cortex: Dr. Livingston was interested in a limited procedure, if surgery was indicated, which would lead to less deteriorating effects in the postoperative state than other forms of psychosurgery. His operation was confined to isolation of the anterior cingulate cortex primarily, the operation being carried out through large burr holes placed on each side of the midline. A small segment of cortex was then removed, and the tract was opened down to the region of the anterior cingulate cortex. This work was based on animal experiments which had been conducted by Dr. Wilbur K. Smith and others. The operation was carried out 2 cm. anterior to the lateral ventricle and 4 cm. posteriorly. If an equivalent amount of cortex were resected, this would amount to approximately 16 gm. as closely as I can figure it.

Twenty-four patients were reported upon, followed for more than two years. These were apparently chronic patients, with only two being relatively intact from a psychiatric point of view. And of these twenty-four, seven improved, including the two relatively intact patients, but also five were given a poor preoperative prognosis.

Later on, lobotomy, after cingulate cortex isolation, was carried out with no significant benefit in some of these patients.

It was of interest to me that four control cases were carried through this series by proceeding with the operation to the surface of the brain but not performing any actual lesion on the brain itself. This, I feel, is an extremely praiseworthy procedure, because it has been alleged by some that any operation by itself serves to improve the psychiatric condition of the patient. By way of comment, we have carried out the same type of procedure at the State Hospital's research project at Greystone Park, New Jersey, where some patients were not subjected to an actual operation upon the brain but only to preliminary craniotomy and that again did not lead to improvement, as did operations upon the brain itself. So I think it may be

said, as Dr. Livingston has emphasized, that the operation per se is not the factor that is of importance to us, but the actual intracerebral intervention.

Later on, in these four control patients, by way of corollary, cingulate cortex isolation was carried out with improvement.

Dr. Livingston stated that the postoperative course of these patients was marked by noticeable mood changes of a pleasant nature, and indicated, to me at least, that the changes were more favorable than those obtained after the standard type of prefrontal lobotomy.

It was of interest to me that gradual improvement occurred in some, and rather abrupt remission in two others. This leads me to wonder whether or not there were not progressive vascular changes, or softening perhaps, that might later have caused additional changes to those that he described at the time of operation. I think this will be of interest and probably will be solved in the course of time with eventual postmortem anatomic studies if such are obtained, so that we may have some better idea of this matter.

By way of comment on Dr. Livingston's paper, I wonder whether perhaps additional fibers, connections with the frontal lobe, may not have been divided during the course of his approach to the cingulate cortex. I think this is inevitably the case. How much, we cannot say; probably not much. But that may be one factor contributing toward the improvement in some of these patients.

I should like to ask him another question, and that pertains to the autonomic functions attributed to the anterior cingulate cortex. As you all know, that region of the cortex has been said to represent many so-called autonomic functions. We have indications in the laboratory that that is so. We have some indications in the human that that is so as a result of excitation of that region in the psychotic patient at the time of operation, where there may be holding of the breath, pupillary dilatation, or changes in blood pressure, and pulse rate or rhythm. If that be so, ablation or isolation of that cortex should result in at least temporary autonomic changes of this character or related character.

I should like to ask Dr. Livingston to comment on whether there were any immediate post-operative autonomic changes as might be expected, such as occur in the laboratory preparation.

I should also like him to comment on the incidence of epilepsy following his procedure.

Turning next to the paper by Dr. Spiegel and his colleagues on stereotaxic thalamotomy: it was indicated by Dr. Spiegel that a high degree of accuracy was obtained as a result of checks by injection of radio-opaque substances at the site of the stereotaxic lesion and also in two post mortem examinations. Sixty-one patients were described, of whom forty-five were schizophrenic patients. There were ninety-three operations with two losses.

The main effect of the operation was that in the emotional sphere, with relief of anxiety as the predominant factor. Rorschach tests indicated improvement in some spheres but not in all spheres.

I was interested in the approximate percentage of improvement in the schizophrenic group, which correlates pretty well with that given by others following other types of operations, such as lobotomy or cortical ablations.

The subject of hypothalamic as well as dorsomedial thalamic nuclear lesions was then described, and it was indicated that some patients were improved, when dorsomedial nuclear lesions had not resulted in improvement, after secondary hypothalamic lesions, and that the same applied to anterior thalamic lesions. It was also said that anterior thalamic nuclear lesions themselves might lead to improvement in some patients.

These observations are of extreme interest to us, tying in with the observations made by Dr. Livingston to the effect that the anterior cingulate cortex, representing Broadman's area 24, which is known to have relays to and from the anterior thalamic nucleus, may lead to the patient's improvement upon isolation or destruction thereof. In other words, this would seem to be an important circuit in relation to the emotional responses of a patient. So the interruption of this circuit anywhere along the line may apparently lead to improvement in the psychiatric state and emotional or affective sphere.

It would seem also from Dr. Speigel's presentation that the effects of his procedure are less drastic as to memory and other changes than some other procedures, such as certain types of lobotomy.

I should like to ask Dr. Spiegel the same question that I direct to Dr. Livingston, namely, what have been the immediate postoperative autonomic effects following hypothalamic lesions? Theoretically, there should be profound effects of this character, and it seems to me it would be of interest to all of us to know what, if any, occurred.

Dr. Spiegel's presentation brings up another matter, that of whether or not the thalamic nuclear lesions, per se, are the responsible agents for the improvement of these patients. It would seem that is the major reason, but another reason occurs to me, that is, one of retrograde degeneration of cortical cells in the areas of cortex having relays to and from the involved thalamic nuclei. We know that such degeneration must occur, of course. And one wonders whether there may not be two effects in this type of procedure, that is, a subcortical effect primarily dealing with the emotional aspects of the patient's reactions and perhaps another due to secondary effects upon the cortical mantle of the cerebrum, predominantly frontal lobe, of course, which may alter the association functions of the patient. That is a large subject and, of course, cannot be fully answered at this time.

Turning finally to the excellent presentation of Drs. Bonner, Cobb,

Sweet, and White: I agree heartily that cordotomy is the first procedure of choice for patients suffering from severe pain at a level amenable to spinal cord surgery, because there is no reason why any ill effects should occur, such as leg or bladder paralysis. That is a risk, to be sure, but it has a low incidence. And cordotomy may provide relief from pain and striking improvement in the emotional attitude of the patient.

Patients suffering from severe constant pain due to carcinomatosis of the pelvis find themselves in a state of profound depression and agitation over their plight, and are the kind that respond well to lobotomy. But I prefer cordotomy, for they may respond equally well, from the emotional point of view, to cordotomy. The pain goes, and so does their distressing psychological condition. They become almost euphoric, probably by way of contrast to their previous pain. So cordotomy is certainly the first procedure of choice.

If one is faced with the necessity of a lobotomy because of progressive pain or severe pain in the head or neck due to cancer in that region, which is not amenable to spinal cord surgery, then I think lobotomy is the procedure of choice.

It was interesting to me in Dr. Bonner's presentation that the main features of their work revealed a more striking effect upon the patient presumably with intact cerebral function than in the psychotic patient after an equivalent cerebral lesion. That has been our experience with other types of psychosurgery and, I think, the experience of all engaged in this field. It probably has profound implications that we are not able to explain at this time. One wonders a little bit whether there may not be some correlation with this observation and the temporal lobe surgery that we heard of this afternoon. In other words, in the intact patient a lesion of the medial temporal cortex, as Dr. Walker described it, may lead to profound emotional changes of an adverse character, and yet the same type of lesion, or an equivalent lesion, in the patient with abnormal temporal lobe electroencephalographic changes may not produce such adverse changes at all. In other words, if you remove cortex that is functioning abnormally, then theoretically you may not produce the adverse effects that you will if you remove normal cortex from an intact individual.

That is merely a possiblility that I suggest, and that may be the case in the psychotic patient, where there may be disturbances in the frontal cortex or in subcortical circuits, so that interruption of those circuits by any means does not create the profound changes that occur following the same type of lesion in a pain patient with intact circuits.

The interesting data on the quantity of the operation are also pertinent, not only to pain surgery but also to so-called psychosurgery, because they indicate that the quantity does affect the postoperative changes in the

emotional sphere. That has been our observation also in cortical ablations where it is possible to measure the amount of cortex resected. Granted that those measurements are crude and far from accurate, they at least serve as an index to show that the quantity is important. Too little frontal lobe surgery in the psychotic patient will not lead to improvement; too much may produce profound adverse changes. And that has been the experience of those engaged in extensive lobotomy work.

I think Dr. White and Dr. Bonner have also pointed out that profound psychological changes of an adverse character may occur if the operation is too gross.

I was interested in the presentation of unilateral lobotomy cases for the relief of pain which showed only moderate psychological changes. As I read the slide, of 18 such patients, 14 had good results as far as relief of pain was concerned. So that perhaps the unilateral procedure is the one of choice, as a first step at least, as it does create beneficial effects without too many adverse changes.

In summary, then, I should like to congratulate these speakers again and to point out that we have heard emphasized again the possibility that circuits other than the prefrontal portion of the cortex and its relays may be responsible for improvement in psychotic and psychoneurotic states. We have heard it pointed out that the quantitative factor is important, and I think we are all agreed that the type of operation and the quantity of the operation should be suited to the given patient and that a *standard* procedure should not be applied to all patients, whether suffering from pain or a psychosis.

I should like to thank the speakers again and say that we shall now go on to the four questions from the floor.

DISCUSSION

Chairman Pool: The first question is submitted to Dr. White by Dr. John E. Scarff: "Would Dr. White permit presentation of some data at variance with his own before the Association?"

Dr. James C. White: I am delighted Dr. Scarff is here, and was hoping he would do just that.

Chairman Pool: I am afraid that this is out of order. We have not been able to do this before in past years at the Association Meetings. I have consulted our President, and I am sorry that we cannot make a breach of the rules. Our time schedule does not permit presenting another paper. Dr. Scarff may however ask any questions.

Dr. White: I should just like to add one point that Dr. Bonner said she neglected to mention—that we have yet to see a patient who has survived any form of frontal lobe operation for control of pain even for a long time, who could possibly have gone back to work.

Last spring we had a symposium here in New York, and I asked Dr. James Watts if he

had ever done leucotomy for pain where the patient had been able to go back to his ordinary job. He said that he had had only one patient who had gone to work. He was a taxi driver and he was bounced the next day because he was so fresh to his fares.

CHAIRMAN POOL: I have one more question, Dr. White: "Do you have any comments regarding the combination of cordotomy and rhizotomy with unilateral or modified lobotomies?"

DR. WHITE: No, except to say that, when in doubt, I would always try the cordotomy or posterior rhizotomy first. There are some patients, however, in whom I know that I cannot obtain adequate relief with either a cordotomy or a rhizotomy. In such I have no hesitation in recommending leucotomy. For example, one of our patients had a huge melanosarcoma of the neck that was compressing the trachea. Not only was there tremendous pain but there was mental anguish because he thought he was going to choke to death. Leucotomy relieved his suffering from both these factors. On the other hand, I have tried cordotomy in such desperate situations as that of a women with bilateral pain following multiple sympathectomies for Raynaud's disease in the upper part of the chest. She had pain in the upper chest on both sides as well as in the shoulders. We had to do the cordotomy bilaterally at the first and second cervical segments in two stages. She has been relieved now for over a year.

DR. A. EARL WALKER [Baltimore, Md.]: There is not complete agreement upon the intellectual and personality changes following unilateral frontal lobotomy for pain. In 1949 Scarff reported the results of unilateral lobotomy performed for the relief of pain in 33 patients of which 24 received formal postoperative psychometric evaluation. Of these 24 postoperative evaluations only one was scored as low as "borderline". Unfortunately, this patient had been so ill with his malignant disease and so incapacitated with pain prior to his lobotomy that preoperative psychometric testing had not been possible. On the other hand, 5 of the 24 scored "superior" ratings after operation and 2 scored "very superior". Fifteen of the patients had both pre- and postoperative psychometric evaluations. Eleven of these showed no significant difference between their pre- and postoperative scores. Four did show falls in score, ranging from 13 to 23 points. In each of these 4 patients, however, there were factors other than the operation which might well have contributed to the lowered score. One had cerebral metastases; one was in the terminal stages of carcinomatosis by the time postoperative testing was done; and two others had shown strong neuropsychiatric traits prior to the lobotomy.

Quite apart from these formal scores but of great importance in evaluating the results of the operation were the opinions of the patient's personality after operation as expressed by friends and relatives. In not a single instance was the comment made that the patient's personality had suffered. In several instances family and friends expressed pleasure over the striking improvement in the patient's social outlook after the operation which was considered to be the result of the patient's relief from pain.

Since the initial report Scarff has performed many more cases of unilateral prefrontal lobotomy for the relief of pain. Nothing has occurred in this much larger series to modify the opinions expressed in that earlier report. One patient resumed his activities as an expert tax accountant after unilateral lobotomy; another patient resumed his duties as teacher of science and laboratory work in a training school for nurses. In neither instance did employer or associates describe any alteration in personality or any intellectual impairment. One patient operated upon was the mother of a doctor and another was the sister-in-law of a doctor. In both instances frequent and persistent questioning of the members of the family failed to reveal any evidence of intellectual or emotional deterioration in these two highly intelligent and sensitive women.

My personal experience with the unilateral lobotomy for pain has led me to the conclusion

that in a small percentage of cases the results are excellent. I think in the older age groups, especially in patients over 50, that there is some mental and personality deterioration, which may be mild or severe, even with the unilateral prefrontal lobotomy. I would then question if the differences in the results of Drs. White et al. and Scarff's results might not be explained on a difference in the patients operated. Could the age and general physical state of the two series offer an explanation for the diverse results?

CHAIRMAN POOL: Thank you, Dr. Walker. I am glad we have Dr. Scarff's data on the record.

I should like to ask Dr. Spiegel the same question that I direct to Dr. Livingston, namely, what have been the immediate postoperative autonomic effects following hypothalamic lesions? Theoretically, there should be profound effects of this character, and it seems to me it would be of interest to all of us to know what, if any, occurred.

Dr. Spiegel's presentation brings up another matter, that of whether or not the thalamic nuclear lesions, per se, are the responsible agents for the improvement of these patients. It would seem that is the major reason, but another reason occurs to me, that is, one of retrograde degeneration of cortical cells in the areas of cortex with relays to and from the involved thalamic nuclei. We know that such degeneration must occur, of course. And one wonders whether there may not be two effects in this type of procedure, that is, a subcortical effect primarily dealing with the emotional aspects of the patient's reactions and perhaps another due to secondary effects upon the cortical mantle of the cerebrum, predominantly frontal lobe, of course, which may alter the association functions of the patient. That is a large subject and, of course, cannot be answered at this time.

DR. HENRY FREUND: Neurosurgeons are usually afraid to injure the hypothalamus. What are your complications in hypothalamotomy? Have you noticed hyperpyrexia?

DR. DELGADO: What is the intensity of current and duration for producing lesions? What is the size of the exposed surface of the electrode?

DR. E. A. SPIEGEL: Since we produced only small, circumscribed lesions in the subthalamus and lateral part of the hypothalamus, the autonomic effects such as hyperthermia, polyuria, flushing of the skin, anisocoria of the pupils were only slight and transitory. Also, the somnolence lasted a few days only. Dr. H. Kuhlenbeck studied the retrograde degeneration in the frontal lobe following electrolytic lesions we had placed in the dorsomedial nuclei in monkeys. We were surprised to find that this retrograde degeneration affected only a rather small amount of cells in the frontal cortex. It seems that the fronto-thalamic system sending corticofugal fibers from the frontal lobe to the dorsomedial nuclei is less developed than the corresponding thalamo-frontal system, at least in the monkey's brain. In order to produce small lesions of 2 to 3 mm. diameter, we used insulated electrodes of 0.8 mm. diameter, with a pointed end, from which the insulation had been scraped off for a distance of 0.5 to 1 mm. A direct current of 3 milliamperes was applied for 1 minute. For large lesions a special stylet electrode was devised consisting of an insulated sheath and an inner stainless steel wire. The latter is pushed into the brain for a distance of 3 mm.; a direct current of 10 milliamperes is applied for 1 minute. This results in an ovoid lesion about 4 mm. in length and 2 to 3 mm. in width.

CHAIRMAN POOL: The next question is addressed to Dr. Livingston by Dr. Scoville: "How does Dr. Livingston explain the discrepancy in results in Scoville's 39 cases and his 72 cases? Can it be that he has included more white matter in his isolation?"

DR. KENNETH E. LIVINGSTON: I do not know how to explain the discrepancy between the results which we have seen from anterior cingulate isolation and those which Dr. Scoville reports, particularly since it is our impression that the lesion we produce is less extensive than the one which he describes. Dr. Scoville's pessimism regarding the lack of therapeutic effectiveness of anterior cingulate lesions is not supported by our experience. We believe that further clinical study may demonstrate that this area has some degree of therapeutic specificity consistent with its known physiological functions.

Regarding Dr. Pool's question, there were two patients of the 24 who had one or more seizures during the two year follow up period.

Unfortunately, we have not been able to study autonomic changes selectively, but we have not seen any gross disturbance such as pupillary change, sweating or shivering reactions, or changes in blood pressure.

As to Dr. Pool's comment regarding the section of other fibers in approaching the anterior cingulate area, I am sure he is entirely correct, although we make an effort to restrict this interference as much as possible. Controls limited to the lesion produced in approaching Area 24 would be desirable. However, the lesion produced in approaching Area 24 is essentially the same as that used in the approach for the Lyely-Poppen type of standard lobotomy so that comparison between these two groups should be reliable from this standpoint.

CHAIRMAN POOL: Thank you, Dr. Livingston.

In closing this meeting, I should like to thank, on behalf of the President, Dr. Wortis, and the Vice Presidents, Dr. Whitehorn and myself, the members of the Commission who have come here and served so faithfully and helped us so much.

LIST OF MEMBERS
ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASE

1951

Sustaining Members

EBAUGH, FRANKLIN G., 4200 East 9th Ave., Denver, Colorado
GRAVES, ROBERT WILLIAM, Albany Hospital, Albany, N. Y.
LITTLEJOHN, WILMOT S., 2629 Aberdeen Road, Birmingham 5, Ala.
REID, WILLIAM L., Sydney University, Sydney, New South Wales, Australia
ROBBINS, EDWARD W., 503 Reed St., Philadelphia 47, Pa.
TARLOV, ISADORE M., 1249 Fifth Ave., New York 29, N. Y.
TIMME, WALTER, Cold Spring, Putnam County, N. Y.
TURNEY, M. FRANK, Medical Arts Bldg., Knoxville, Tenn.
WHITE, JAMES C., Massachusetts General Hospital, Boston 14, Mass.

Associate Members

BERRY, CHARLES M., 1300 York Ave., New York 21, N. Y.
BROOKS, CHANDLER McC., 350 Henry St., Brooklyn 2, N. Y.
CHAMBERS, WILLIAM W., University of Pennsylvania School of Medicine, Philadelphia 4, Pa.
CHATFIELD, PAUL O., 25 Shattuck Street, Boston 15, Mass.
CROSBY, ELIZABETH C., University of Michigan, Ann Arbor, Mich.
FLEXNER, LOUIS B., University of Pennsylvania School of Medicine, Philadelphia 4, Pa.
FOLCH-PI, JORDI, 7 Exeter St., Boston, Mass.
FRANK, KARL, 4628 Chestnut St., Bethesda 14, Md.
FUORTES, M. G. F., Route #1, Layhill, Silver Springs, Md.
GATES, REGINALD R., Harvard University, Cambridge, Mass.
GOTTSCHALK, LOUIS A., National Institute of Mental Health, Bethesda 14, Md.
GRUNDFEST, HARRY, 630 West 168th St., New York 32, N. Y.
HALSTEAD, WARD C., 5537 University Ave., Chicago 37, Ill.
HARMAN, PINCKNEY J., 477 First Ave., New York 16, N. Y.
HEBB, D. O., McGill University, Montreal 2, Canada
HINES, MARION, Emory University, Georgia
HOOKER, DAVENPORT, University of Pittsburgh School of Medicine, Pittsburgh 13, Pa.
HUMPHREY, TRYPHENA, University of Pittsburgh School of Medicine, Pittsburgh 13, Pa.
JARCHO, LEONARD W., Johns Hopkins Hospital, Baltimore 5, Md.
KUNTZ, ALBERT, 1402 S. Grand Blvd., St. Louis 4, Mo.
LASSEK, ARTHUR M., 80 E. Concord St., Boston 18, Mass.
LILIENTHAL, JOSEPH L., JR., Johns Hopkins Hospital, Baltimore 5, Md.
LILLY, JOHN C., 3600 Spruce St., Philadelphia 4, Pa.
LIVINGSTON, ROBERT B., 333 Cedar St., New Haven, Conn.
MALMO, ROBERT B., 1025 Pine Avenue West, Montreal 2, Canada
MANERY, JEANNE F., University of Toronto, Toronto, Canada

Mettler, Fred A., 630 West 168th Street, New York 32, N. Y.
Moyer, Elizabeth, 80 E. Concord St., Boston 18, Mass.
Nachmansohn, David, 630 West 168 St., New York 32, N. Y.
Rasmussen, Andrew T., 4636 Indianola Way, La Canada, Calif.
Siebens, Arthur A., 350 Henry St., Brooklyn 2, N. Y.
Sprague, James M., University of Pennsylvania School of Medicine, Philadelphia 4, Pa.
Waller, William H., 80 E. Concord St., Boston 18, Mass.
Woolsey, Clinton N., University of Wisconsin Medical School, Madison 6, Wis.

Active Members

Abbott, John A., Massachusetts General Hospital, Boston, Mass.
Abbott, Kenneth H., 350 E. Broad St., Columbus, Ohio
Abramson, Joseph L., 874 Park Place, Brooklyn 16, N. Y.
Ackerly, Spafford, 206 E. Chestnut St., Louisville, Ky.
Adams, Raymond D., 320 Adams St., Milton, Mass.
Adler, Alexandra, 32 East 39th St., New York 16, N. Y.
Alamprese, Donato J., 1226 13th Ave., Altoona, Pa.
Alderman, Jerome E., 712 E. Jefferson St., Syracuse, N. Y.
Alexander, Eben Jr., Bowman Gray School of Medicine, Winston-Salem, N. C.
Alexander, Leo, 433 Marlborough St., Boston, Mass.
Alpers, Bernard J., 111 N. 49th St., Philadelphia 39, Pa.
Ames, Thaddeus H., Route 1, Box 1496, Scottsdale, Ariz.
Amols, William, 710 West 168th St., New York 32, N. Y.
Anderson, James L., 2947 Coral Way, Miami, Fla.
Anderson, Milton H., Osawatomie State Hospital, Osawatomie, Kan.
Appel, Kenneth E., 111 N. 49th St., Philadelphia 39, Pa.
Arana, Roman, Convencion 1287, Montevideo, Uruguay
Aring, Charles D., Cincinnati General Hospital, Cincinnati 29, Ohio
Arnold, Jesse O., 36 Pleasant St., Worcester, Mass.
Arnot, Robert E., 422 Beacon St., Boston, Mass.
Arzt, Philip K., 844 Lowery Medical Arts Bldg., St. Paul, Minn.
Asenjo, Alfonso G., Casilla 1531, Sanitago, Chile
Ayer, James B., 319 Longwood Ave., Boston, Mass.

Badal, Daniel W., University Hospital, Cleveland 6, Ohio
Baganz, Crawford N., V. A. Hospital, Lyons, N. J.
Bailey, Orville T., 1315 W. 10th St., Indianapolis 7, Ind.
Bailey, Pearce, Director, National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda 14, Md.
Baker, A. B., University of Minnesota Medical School, Minneapolis 14, Minn.
Ballantine, H. Thomas Jr., 319 Longwood Ave., Boston, Mass.
Balser, Benjamin H., 872 Fifth Ave., New York 21, N. Y.
Bamford, Thomas E. Jr., 880 Fifth Ave., New York, N. Y.
Bard, Philip, 710 N. Washington St., Baltimore 5, Md.
Barris, Ralph W., 7817 Herschel Ave., LaJolla, Calif.
Batkin, Stanley, University Hospital of the Good Shepherd, Syracuse 10, N. Y.
Beck, Gilbert M., 276 Linwood Ave., Buffalo 9, N. Y.
Bell, Aaron, 57 West 57th St., New York 19, N. Y.
Benda, Clemens E., 27 Hopkins Road, Arlington, Mass.
Bender, Morris B., 1150 Park Ave., New York 28, N. Y.

Bennett, A. E., 2000 Dwight Way, Berkeley 4, Calif.
Berens, Conrad, 708 Park Ave., New York 21, N. Y.
Berman, Sidney, 32 Sycamore Circle, Stratford, Conn.
Berman, William, 204 Martine Ave., White Plains, N. Y.
Berry, Richard G., U. S. Naval Hospital, Bethesda 14, Md.
Binger, Carl, 125 East 73rd St., New York 21, N. Y.
Black, Samuel P. W., 789 Howard Ave., New Haven, Conn.
Blain, Daniel, 1785 Massachusetts Ave. N.W., Washington, D. C.
Blakeslee, George A., 105 East 53rd St., New York 22, N. Y.
Blau, Abram, 47 East 88th St., New York 28, N. Y.
Bohn, Z. Stephen, 10 Peterboro, Detroit, Mich.
Bollmeier, Ludolf N., 331 Thompson Bldg., Hot Springs, Ark.
Bond, Earl D., 111 North 49th St., Philadelphia 39, Pa.
Booth, Carl B., 128 Thornton Rd., Chestnut Hill, Mass.
Borkowski, Winslow J., 1812 Chandler St., Philadelphia, Pa.
Botterell, E. Harry, 280 Bloor Street W., Toronto 5, Canada
Bowman, Karl M., University of California Medical School, San Francisco, Calif.
Braceland, Francis J., 200 Retreat Ave., Hartford, Conn.
Bragdon, Floyd H., Mercy Hospital, Pittsburgh 19, Pa.
Brickner, Richard M., 1000 Park Ave., New York 28, N. Y.
Bridges, Thomas J. Jr., 199 Ft. Washington Ave., New York 32, N. Y.
Brock, Samuel, 115 East 61st St., New York 21, N. Y.
Brody, Bernard S., 235 Bishop St., New Haven, Conn.
Brody, Matthew, 41 Eastern Parkway, Brooklyn, N. Y.
Brosin, Henry W., 3811 O'Hara St., Pittsburgh 13, Pa.
Brousseau, Albert, 109 Avenue Henri-Martin, Paris, France
Browder, E. Jefferson, 200 Hicks St., Brooklyn, N. Y.
Brown, Joe R., 102–110 Second Ave., S.W., Rochester, Minn.
Browne-Mayers, A. N., 55 East 86th St., New York 28, N. Y.
Buckley, Paul J., 159 Palisade Ave., Bogota, N. J.
Buckley, Richard C., 111 Gillett St., Hartford, Conn.
Bullard, Dexter M., Chestnut Lodge, Rockville, Md.
Burley, Benjamin T., 19 High St., Worcester, Mass.
Burr, Harold S., Sterling Hall of Medicine, New Haven, Conn.
Byers, Randolph K., 319 Longwood Ave., Boston, Mass.

Cameron, D. Ewen, Royal Victoria Hospital, Montreal, Canada
Campbell, James B., 630 West 168th St., New York 32, N. Y.
Caner, G. Colket, 63 Marlborough St., Boston, Mass.
Cannaday, Royal G., 121 East 60th St., New York 22, N. Y.
Carey, Thomas C., 111 Gillett St., Hartford 5, Conn.
Carlisle, Chester L., 500 N. California Ave., Palo Alto, Calif.
Carlson, Earl R., Pumpano, Florida
Carroll, Patrick, 115 East 61st St., New York 21, N. Y.
Carter, Sidney, 710 West 168 St., New York 32, N. Y.
Casamajor, Louis, 710 West 168th St., New York 32, N. Y.
Cash, Paul T., 402 Equitable Bldg., Des Moines, Iowa
Cattanach, George S., 115 East 61st St., New York 21, N. Y.
Cattell, James P., 722 West 168th St., New York 32, N. Y.
Caveness, William F., Lt. Comdr. (MC), U. S. Naval Hospital, Navy 3923, c/o Fleet Post Office, San Francisco, Calif.

Cazzullo, Carlo Lorenzo, Via Besana 8, Milano, Italy
Chamberlain, Olin B., Medical College State of S. C., Charleston 16, S. C.
Chaney, L. Beverley, 572 Park Ave., New York 21, N. Y.
Cheney, Roger H., 62 Bellevue Ave., Springfield, Mass.
Chesher, Earl C., 700 West 168th St., New York 32, N. Y.
Chiavacci, Ludwig V., 27 West 86th St., New York 24, N. Y.
Chor, Herman, 700 N. Michigan Place, Chicago, Ill.
Chrzanowski, Gerard, 68 East 86th St., New York 28, N. Y.
Churchill, John A., 85 Jefferson St., Hartford, Conn.
Chusid, Joseph G., St. Vincent's Hospital, New York 11, N. Y.
Cobb, Stanley, Massachusetts General Hospital, Boston, Mass.
Cohen, Mandel E., Massachusetts General Hospital, Boston, Mass.
Cohen, Sidney M., 405 West 23rd St., New York, N. Y.
Cohn, Robert, Pyle Road, Locust Ridge, Bethesda 14, Md.
Cole, Edwin M., 311 Beacon St., Boston, Mass.
Collier, G. Kirby, 47 Colby St., Rochester 10, N. Y.
Collins, Lawrence M., Greystone Park, N. J.
Collip, J. B., University of Western Ontario, London, Ontario, Canada
Cone, William V., 3801 University St., Montreal, Canada
Constable, Kate, 16 East 84th St., New York 28, N. Y.
Corrigan, Patrick H., 1720 S. Broad St., Trenton, N. J.
Corrin, Kenneth M., 1307 N. Rodney St., Wilmington, Del.
Corson, Harold F., 2004 N. Randolph St., Arlington, Va.
Costello, Russell T., 630 Fisher Bldg., Detroit 2, Mich.
Cramer, Fritz, 16 E. 84th St., New York 28, N. Y.
Crandell, C. Archie, Greystone Park, N. J.
Crawford, Albert S., Henry Ford Hospital, Detroit 2, Mich.
Crispell, Raymond, 595 McAfee St., Atlanta, Ga.
Crothers, Bronson, 300 Longwood Ave., Boston, Mass.
Curran, Frank J., 603 Watson Ave., Charlottesville, Va.
Currier, F. P. Jr., 26 Sheldon Ave. S.E., Grand Rapids, Mich.
Curry, Marcus A., N. J. State Hospital, Greystone Park, N. J.

Daley, Mark J., 242 Valentine Lane, Yonkers, N. Y.
Daniels, James T., 642 Park Ave., New York 21, N. Y.
Dattner, Bernard, 133 East 58th St., New York 16, N. Y.
Davidoff, Leo M., 815 Park Ave., New York 21, N. Y.
Davis, Hallowell, 818 S. Kingshighway, St. Louis 10, Mo.
Davis, Thomas K., 70 East 77th St., New York 21, N. Y.
Davison, Charles, 1155 Park Ave., New York 28, N. Y.
de Gutierrez Mahoney, C. G., St. Vincent's Hospital, New York 11, N. Y.
Deichelmann, Stephen J., Dufur Hospital, Ambler, Pa.
DeJong, Russell N., University Hospital, Ann Arbor, Mich.
Delmas-Marsalet, Paul, 144 Rue Abbé-de-l'Epée, Bordeaux, France
D'Elseaux, Frank C., 37 Marlborough St., Boston, Mass.
Demuth, Edwin L., 5 Mamaroneck Road, White Plains, N. Y.
Denbo, Elic A., 596 Benson St., Camden, N. J.
Denker, Peter G., 140 E. 54th St., New York 22, N. Y.
Denny-Brown, Derek E., Neurological Unit, Boston City Hospital, Boston 18, Mass.
D'Errico, Albert, 510 Medical Arts Bldg., Dallas, Tex.
Deutsch, Albert L., 80 Clarkson Ave., Brooklyn 26, N. Y.

Deutsch, Felix, 82 Marlborough St., Boston, Mass.
Dickel, Herman A., 707 Medical Dental Bldg., Portland 5, Ore.
Dieterle, Robert R., 950 Stein Road, Ann Arbor, Mich.
Diethelm, Oskar, 525 East 68th St., New York 21, N. Y.
Dorsey, Joseph F., 270 Commonwealth Ave., Boston, Mass.
Doshay, Lewis J., 710 W. 168th St., New York 32, N. Y.
Doyle, Arthur M., 280 Bloor Street West, Toronto, Canada
Drayer, Calvin S., 111 N. 49th St., Philadelphia 39, Pa.
Drew, Arthur L. Jr., University Hospital, Ann Arbor, Mich.
Dribben, Irving S., 66C Weis Road, Albany, N. Y.
DuBois, Franklin S., Silver Hill Foundation, New Canaan, Conn.
Dunbar, Flanders, 1 East 69th St., New York 21, N. Y.
Duncan, Dean H., Highland Clinic, Shreveport, La.
Dunsmore, Rembrandt H., 85 Jefferson St., Hartford, Conn.

Eberhart, John C., 6915 Blaisdell Road, Bethesda, Md.
Echlin, Francis A., 555 Park Ave., New York 21, N. Y.
Ecker, Arthur D., 608 E. Genesee St., Syracuse, N. Y.
Ehrenclou, Alfred H., 925 Park Ave., New York 28, N. Y.
Ehrlich, William, 31 Lincoln Park, Newark, N. J.
Eisendorfer, Arnold, 11 East 68th St., New York 21, N. Y.
Eisenhardt, Louise, Yale University School of Medicine, New Haven, Conn.
Elwyn, Adolph, 630 West 168th St., New York 32, N. Y.
Englander, Charles, 41 Hillside Ave., Newark, N. J.
Epstein, Joseph, 1 Fanshaw Ave., Yonkers 5, N. Y.
Epstein, Samuel H., 276 Commonwealth Ave., Boston, Mass.
Erickson, Theodore C., 531 N. Pinckney St., Madison 3, Wis.
Evans, Harrison, 463 E. Town St., Columbus, Ohio
Evans, Joseph P., Cincinnati General Hospital, Cincinnati 29, Ohio
Everts, William H., 421 Hugenot St., New Rochelle, N. Y.

Fabing, Howard D., 2314 Auburn Ave., Cincinnati 19, Ohio
Farmer, Thomas W., University of N. C. School of Medicine, Chapel Hill, N. C.
Farnell, Frederick J., 51 East 90th St., New York 28, N. Y.
Fay, Temple, 8811 Germantown Ave., Philadelphia 18, Pa.
Feigin, Irwin H., 201-02 Rocky Hill Road, Bayside, N. Y.
Feigin, Samuel, 840 Park Ave., New York 21, N. Y.
Feiring, Emanuel, 815 Park Ave., New York 21, N. Y.
Felix, Robert H., National Institutes of Health, Bethesda 14, Md.
Fetterman, Joseph L., 10528 Park Lane, Cleveland 6, Ohio
Fine, Isidor, 683 Montgomery St., Brooklyn 13, N. Y.
Finesinger, Jacob E., University of Maryland, Baltimore 1, Md.
Finkelman, Isidore, 5729 N. Central Park Ave., Chicago, Ill.
Finley, Knox H., 450 Sutter St., San Francisco, Calif.
Fish, David J., 355 Thayer St., Providence 6, R. I.
Flanagan, Norris B., 270 Commonwealth Ave., Boston, Mass.
Flicker, David J., 82 Clinton Ave., Newark 5, N. J.
Florio, William A., 1880 Bedford Ave., Brooklyn 25, N. Y.
Flowers, Hiland L., 631 Kappock St., Bronx 63, N. Y.
Forster, Francis M., Georgetown University Hospital, Washington 7, D. C.

Fox, James C., 85 Jefferson St., Hartford 6, Conn.
Frantz, Angus M., 515 Park Ave., New York 21, N. Y.
Freed, Herbert, 255 S. 17th St., Philadelphia 3, Pa.
Freedman, David A., 3706 Prytania St., New Orleans 15, La.
Freeman, Rowland G. Jr., Dover Road, Millis, Mass.
Freeman, Walter, 2014 R St. N.W., Washington 9, D. C.
Fremont-Smith, Frank, 565 Park Ave., New York 21, N. Y.
Freyhan, Fritz A., Delaware State Hospital, Farnhurst, Del.
Friedemann, Max, 251 Central Park West, New York 24, N. Y.
Friedman, Arnold P., 71 East 77th St., New York 21, N. Y.
Friedman, E. D., 1192 Park Ave., New York 28, N. Y
Friedman, Jacob H., 1749 Grand Concourse, Bronx 53, N. Y.
Frimmer, Isidore, 1227 Grand Concourse, Bronx 52, N. Y.
Frocht, Maurice, 610 W. 100th St., New York 25, N. Y.
Fuller, Earl W., 8 Mill Road, Morris Plains, N. J.
Fulton, John F., 333 Cedar St., New Haven, Conn.
Furst, William, 188 Clinton Ave., Newark, N. J.

Gahagan, Lawrence H., 555 Park Ave., New York 21, N. Y.
Galbraith, James, 117 S. 22nd St., Birmingham 5, Ala.
Gallinek, Alfred, 1165 Fifth Ave., New York 29, N. Y.
Gammon, George D., 3400 Spruce St., Philadelphia, Pa.
Gang, Kenneth M., 50 Wayne Ave., White Plains, N. Y.
Garol, Hugh W., 291 Geary St., San Francisco, Calif.
Garvey, John L., 208 E. Wisconsin Ave., Milwaukee 2, Wis.
Gasser, Herbert, 66th St. & York Ave., New York 21, N. Y.
Gates, Edward M., 224 Riker Bldg., Pontiac, Mich.
Gay, James R., 350 E. Broad St., Columbus, Ohio
Gayle, R. Finley, Professional Bldg., 5th and Franklin Sts., Richmond 19, Va.
German, William J., 333 Cedar St., New Haven, Conn.
Gildea, Edwin F., 640 S. Kingshighway, St. Louis, Mo.
Gilpin, Sherman F. Jr., 255 S. 17th St., Philadelphia 3, Pa.
Gitt, Joseph L., 3615 Olive St., St. Louis 8, Mo.
Glaser, Gilbert H., Yale University School of Medicine, New Haven 11, Conn.
Globus, Joseph H., 960 Park Ave., New York 28, N. Y.
Glusman, Murray, 2431 Webb Ave., New York 63, N. Y.
Gold, Max, 666 Eastern Parkway, Brooklyn, N. Y.
Goldberg, Bernard R., 76 Clinton Ave., Newark 5, N. J.
Goldman, Douglas, 320 Provident Bank Bldg., Cincinnati 2, Ohio
Goldstein, Kurt, 1148 Fifth Ave., New York 28, N. Y.
Goodhardt, S. Philip, 115 East 61st St., New York 21, N. Y.
Gordy, Samuel T., 4312 Spruce St., Philadelphia, Pa.
Gosselin, George, 50 Farmington Ave., Hartford, Conn.
Gottlieb, Bernhardt S., 225 West 86th St., New York 24, N. Y.
Grain, Gerald O., Henry Ford Hospital, Detroit 2, Mich.
Grant, Francis C., 3400 Spruce St., Philadelphia 4, Pa.
Greene, Justin L., 700 West 168th St., New York 32, N. Y.
Greenhill, Maurice H., Duke University School of Medicine, Durham, N. C.
Grenell, Robert G., University of Maryland School of Medicine, Baltimore 1, Md.
Grinker, Roy, 4940 East End Ave., Chicago 15, Ill.

Grino, Antonio, 4592 W. 149th St., Cleveland 11, Ohio
Groff, Robert A., 1930 Chestnut St., Philadelphia 3, Pa.
Gurdjian, E. S., Whitney Bldg., Detroit, Mich.
Guttman, Samuel A., 36 West River St., Wilkes Barre, Pa.

Hadden, Samuel B., 37 S. 20th St., Philadelphia, Pa.
Haines, William H., 2600 S. California Ave., Chicago, Ill.
Hall, Roscoe W., St. Elizabeth's Hospital, Washington, D. C.
Hamby, Wallace B., 140 Linwood Ave., Buffalo 9, N. Y.
Hamill, Ralph C., 8 S. Michigan Ave., Chicago, Ill.
Hamilton, Francis J., 3 East 68th St., New York 21, N. Y.
Hamlin, Hannibal, 270 Benefit St., Providence 3, R. I.
Hammes, Ernest M., 1124 Lowry Medical Arts Bldg., St. Paul 2, Minn.
Hammes, Ernest M. Jr., 1124 Lowry Medical Arts Bldg., St. Paul 2, Minn.
Hand, Morton H., 1620 Ditmas Ave., Brooklyn 26, N. Y.
Harding, George T., 445 E. Granville Road, Worthington, Ohio
Hare, Clarence C., 700 W. 168 St., New York 32, N. Y.
Harper, Edward O., 2064 Adelbert Road, Cleveland, Ohio
Harris, Titus H., University of Texas, Galveston, Tex.
Harter, Harry M., 130-19 224th St., Laurelton 13, L. I., N. Y.
Hasenbush, Lester L., 315 Buckminster Road, Brookline 46, Mass.
Hausman, Louis, 140 East 54th St., New York 22, N. Y.
Heath, Robert G., 1430 Tulane Ave., New Orleans, La.
Heldt, Thomas J., Henry Ford Hospital, Detroit 2, Mich.
Helfer, Lewis M., 705 E. Houston St., San Antonio 5, Tex.
Henry, George, 111 East 71st St., New York 21, N. Y.
Herz, Ernst, 700 West 168th St., New York 32, N. Y.
Hesser, Frederick, Albany Hospital, Albany 1, N. Y.
Heyl, Henry L., Hitchcock Clinic, Hanover, N. H.
Hillier, William F. Jr., City Bldg., Asheville, N. C.
Himwich, Harold E., Galesburg State Research Hospital, Galesburg, Ill.
Hinsey, Joseph C., 1300 York Ave., New York 21, N. Y.
Hinsie, Leland E., 722 West 168th St., New York 32, N. Y.
Hirschfield, Bernard A., 375 West State St., Trenton 8, N. J.
Hoagland, Hudson, 222 Maple Ave., Shrewsbury, Mass.
Hoch, Paul H., 1165 Park Ave., New York 28, N. Y.
Hochstetter, Werner, 71 East 80th St., New York 21, N. Y.
Hodgson, John S., 262 Beacon St., Boston, Mass.
Hoedemaker, Edward D., 4033 E. Madison, Seattle, Wash.
Hoefer, Paul F. A., 710 West 168th St., New York 32, N. Y.
Hoen, Thomas, 1249 Fifth Ave., New York 29, N. Y.
Hohman, Leslie B., Duke Medical School, Durham, N. C.
Hope, Justin M., 88A Chestnut St., Boston 8, Mass.
Horrax, Gilbert, 605 Commonwealth Ave., Boston, Mass.
Horst, Elmer L., 422 Walnut St., Reading, Pa.
Horwitz, William A., 722 West 168th St., New York 32, N. Y.
Howe, Hubert S., 115 East 61st St., New York 21, N. Y.
Hubbard, Oscar E. (Lt. Col. USAF MC) USAF Hosp., 1400th Medical Sqdn. APO 81, c/o Postmaster, N. Y.
Huber, Warren V., 37 Lafayette Ave., Brooklyn 17, N. Y.

Huddleson, James H., Box 3613, Washington 7, D. C.
Hudson, Robert J., 121 University Place, Pittsburgh 13, Pa.
Hughes, William N., 112 Waterman St., Providence 6, R. I.
Hulburt, Margaret (R.N.), 3804 2nd Ave. S., Minneapolis 9, Minn.
Hunt, Edward L., 330 Ocean Ave., Lawrence, N. Y.
Hyman, Irving, 109 Linwood Ave., Buffalo 9, N. Y.
Hyslop, George H., 129 East 69th St., New York 21, N. Y.

Impastato, David J., 40 Fifth Ave., New York 11, N. Y.
Ingraham, F. D., 300 Longwood Ave., Boston, Mass.
Ivey, Evelyn P., 3 Community Place, Morristown, N. J.

Jackson, Arthur H., 111 West Main St., Waterbury, Conn.
Jacobsen, Carlyle F., State University of New York, Albany 1, N. Y.
Jacoby, Ralph J., 1A East 69th St., New York 21, N. Y.
Jasper, Herbert H., 3801 University St., Montreal, Canada
Johnson, George S., Stanford University Hospital, San Francisco, Calif.

Kabat, Herman, 3451 Piedmont Ave., Oakland, Calif.
Kalinowsky, Lothar B., 115 East 82nd St., New York 28, N. Y.
Kaplan, Lawrence L., 55 Park Ave., New York 16, N. Y.
Karliner, William, 1749 Grand Concourse, Bronx 53, N. Y.
Katz, Joel, 1200 Fifth Ave., New York 29, N. Y.
Kaufman, I. Charles, 80 E. Concord St., Boston 18, Mass.
Kaufman, Moses R., Mt. Sinai Hospital, New York 29, N. Y.
Kempf, Edward J., Wading River, L. I., New York
Kennard, Margaret A., Hut S-4, Univ. of British Columbia, Vancouver, Canada
Kepner, Richard E. DeM., P. O. Box 3119, Honolulu 2, T. H.
Kerman, Edward F., 3700 Liberty Heights Ave., Baltimore 15, Md.
Keschner, Moses, 451 West End Ave., New York 24, N. Y.
Kety, Seymour S., National Institutes of Mental Health, Bethesda 14, Md.
Keyes, Baldwin L., 2031 Locust St., Philadelphia 3, Pa.
Kirschenbaum, David, 61-09 37th Ave., Woodside 77, L. I., N. Y.
Kline, Nathan S., Director of Research, State Hospital, Worcester, Mass.
Klingman, Walter, University of Virginia Hospital, Charlottesville, Va.
Kolb, Lawrence C., Mayo Clinic, Rochester, Minn.
Koskoff, Yale D., 3459 Fifth Ave., Pittsburgh 13, Pa.
Krapf, E. Eduardo, Calle Maipu 1266, Buenos Aires, Argentina
Kubie, Lawrence S., 7 East 81st St., New York 28, N. Y.
Kubik, Charles S., 330 Dartmouth St., Boston 16, Mass.

Laidlaw, Robert W., 563 Park Ave., New York 21, N. Y.
Lake, George L., Albany Post Road, Croton-on-Hudson, N. Y.
Lambert, Charles L., 13 East 77th St., New York 21, N. Y.
Lambros, Vasilios, 1832 K Street N.W., Washington 6, D. C.
Landry, Christopher L., 520 Commonwealth Ave., Boston 15, Mass.
Lang, H. B., 800 A. E. Smith State Office Bldg., Albany, N. Y.
Langenstrass, Karl H., St. Elizabeth's Hospital, Washington, D. C.
Langworthy, Orthello, Johns Hopkins Hospital, Baltimore 5, Md.
Lawyer, Tiffany Jr., 4308 Glenridge St., Chevy Chase View, Kensington, Md.

Leavitt, F. H., 1527 Pine St., Philadelphia, Pa.
Lebensohn, Zigmond M., 1712 Rhode Island Ave. N.W., Washington 6, D. C.
Lederer, Henry D., Cincinnati General Hospital, Cincinnati 29, Ohio
Lennox, Margaret, 333 Cedar St., New Haven, Conn.
Lennox, William G., 300 Longwood Ave., Boston 15, Mass.
Levin, Paul M., 1227 Medical Arts Bldg., Dallas 1, Tex.
Levine, Matthew, 170 East 78th St., New York 21, N. Y.
Levine, Maurice, Cincinnati General Hospital, Cincinnati 29, Ohio
Levy, David M., 300 Park Ave., New York, N. Y.
Levy, Irwin, 4952 Maryland Ave., St. Louis, Mo.
Levy, Sol, Eastern State Hospital, Medical Lake, Wash.
Lewis, Bernard L., State University of Iowa, Iowa City, Iowa
Lewis, Nolan D. C., 722 West 168th St., New York 32, N. Y.
Liberson, Wladimir T., 62 Roslyn St., Hartford, Conn.
Liebert, Erich, 844 Douglas, Elgin, Ill.
Lindemann, Erich, Massachusetts General Hospital, Boston, Mass.
Linn, Louis, 70 East 83rd St., New York 28, N. Y.
Lion, Ernest G., 490 Post Street, San Francisco 2, Calif.
List, Carl F., 626 Medical Arts Bldg., Grand Rapids, Mich.
Livingston, Kenneth E., 806 S.W. Broadway, Portland 5, Ore.
Livingston, William K., University of Oregon Medical School, Portland, Ore.
Lloyd, David P. C., 66th St. and York Ave., New York 21, N. Y.
Locascio, Nicholas R., 139 Westminster Drive, Yonkers 3, N. Y.
Loman, Julius, 483 Beacon St., Boston, Mass.
Long, W. L., 2025 Walnut St., Philadelphia, Pa.
Lorand, Sandor, 40 Central Park South, New York 19, N. Y.
Loscalzo, Anthony E., 124 East 40th St., New York 16, N. Y.
Lowenbach, Hans Duke Hospital, Durham, N. C.
Lowenstein, Otto, 865 Park Ave., New York 21, N. Y.
Lowis, Samuel, 475 Commonwealth Ave., Boston, Mass.
Ludlum, Seymour DeW., 1827 Pine St., Philadelphia, Pa.
Lynn, John G., 305 Royal Hawaiian Ave., Honolulu, T. H.

McCartney, James L., 223 Stewart Ave., Garden City, N. Y.
McCulloch, Warren S., 77 Massachusetts Ave., Cambridge 39, Mass.
McDermott, Neil T., 10300 Carnegie Ave., Cleveland, Ohio
McDonald, Charles A., 106 Waterman St., Providence 6, R. I.
McGrath, John F. Jr., 539 East 88th St., New York 27, N. Y.
McGraw, Robert B., 2 East 85th St., New York 28, N. Y.
McKendree, Charles A., 215 East 79th St., New York 21, N. Y.
McKenna, John B., 3 Webster Ave., Hanover, N. H.
McKinney, John M., 70 East 77th St., New York 21, N. Y.
McKnight, William K., Friends Hospital, Roosevelt Blvd. & Adams Ave., Phila. 24, Pa.
MacLean, Alexander R., Mayo Clinic, Rochester, Minn.
McNaughton, Francis L., 3801 University St., Montreal, Canada
McNeil, Edwin F., 3875 Wilshire Blvd., Los Angeles 5, Calif.
McNerney, John C., Rittenhouse Claridge, Rittenhouse Square East, Philadelphia, Pa.
MacPherson, Donald J., 270 Commonwealth Ave., Boston, Mass.
MacRobert, Russell G., 535 Park Ave., New York 21, N. Y.
Mackay, Roland P., 8 S. Michigan Ave., Chicago 3, Ill.

MADONICK, MOSES J., 1882 Grand Concourse, New York 57, N. Y.
MADOW, LEO, 111 N. 49th St., Philadelphia 39, Pa.
MAGLADERY, JOHN W., Johns Hopkins Hospital, Baltimore 5, Md.
MALTBY, GEORGE L., 203 State St., Portland 3, Me.
MARGARETTEN, ISIDORE, 235 East 22nd St., New York 10, N. Y.
MARGOLIN, SYDNEY G., 960 Park Ave., New York 28, N. Y.
MARSHALL, CURTIS, Johns Hopkins Hospital, Baltimore 5, Md.
MASON, VERNE R., 121 N. San Vicente Blvd., Beverly Hills, Calif.
MASSELINK, ROLLO J., 700 West 168th St., New York 32, N. Y.
MAYBARDUK, PETER K., 1160 Park Ave., New York 28, N. Y.
MAYER, EDWARD E., 5601 Forbes St., Pittsburgh 17, Pa.
MAYER, WILLIAM, 115 East 61st St., New York 21, N. Y.
MEARIN, ROBERT J., 37 Lafayette Ave., Brooklyn 17, N. Y.
MEISLIN, JACK, V. A. Hospital, Montrose, N. Y.
MEISTER, FRANKLIN O., 25 W. Michigan Ave., Battle Creek, Mich.
MELLA, HUGO, V. A. Hospital, Coatesville, Pa.
MELTZER, THEODORE, 123 East 37th St., New York 16, N. Y.
MENNINGER, KARL A., The Menninger Foundation, Topeka, Kan.
MENNINGER, WILLIAM C., The Menninger Foundation, Topeka, Kan.
MERLIS, JEROME K., 16 State St., Framingham Centre, Mass.
MERRITT, H. HOUSTON, 710 West 168th St., New York 32, N. Y.
MERWARTH, HAROLD R., 30 Eighth Ave., Brooklyn, N. Y.
MEYERS, RUSSELL, State University of Iowa, Iowa City, Iowa
MICHELSEN, JOST J., 412 Beacon St., Boston 16, Mass.
MILLER, HENRY W., Brewster, N. Y.
MILLER, JOSEPH S. A., Hillside Hospital, Bellerose 6, L. I., N. Y.
MILLER, LEROY, 106 S. Girard Ave., Albuquerque, New Mex.
MILLER, ROBERT B., 10 East 85th St., New York 28, N. Y.
MILLET, JOHN, 25 East 92nd St., New York 28, N. Y.
MILLIKAN, CLARK H., 102 110 Second Ave., S.W., Rochester, Minn.
MIRSKY, I. ARTHUR, University of Pittsburgh School of Medicine, Pittsburgh, Pa.
MITTELMAN, BELA, 130 East 67th St., New York 21, N. Y.
MIXTER, WILLIAM J., 319 Longwood Ave., Boston, Mass.
MOORE, JOSEPH W., 75 Willett St., Albany 6, N. Y.
MOORE, MATTHEW T., 1813 Delancey St., Philadelphia, Pa.
MOORE, MERRILL, 370 Commonwealth Ave., Boston 15, Mass.
MORRIS, ARTHUR A., 915 19th St. N.W., Washington 6, D. C.
MORTON, BENJAMIN F., 2009 Ninth Ave. S., Birmingham 5, Ala.
MOSOVICH, ABRAHAM, Arenales 2189, Buenos Aires, Argentina
MOUNT, LESTER A., 700 West 168th St., New York 32, N. Y.
MUNRO, DONALD, Boston City Hospital, Boston, Mass.
MURPHY, JAMES P., 1911 R St. N.W., Washington, D. C.

NARASIMHAN, S. T., 8F Landons Road, Kilpaulk, Madras, India
NETSKY, MARTIN G., Montefiore Hospital, Gun Hill Road, Bronx 67, N. Y.
NIELSEN, J. M., 727 W. 7th St., Los Angeles, Calif.
NURNBERGER, JOHN I., 200 Retreat Ave., Hartford 2, Conn.

OBERNDORF, CLARENCE P., 40 West 59th St., New York 19, N. Y.
O'DOHERTY, DESMOND S., Georgetown University, Washington 7, D. C.

Oldberg, Eric, 224 S. Michigan Ave., Chicago, Ill.
O'Leary, James L., 640 S. Kingshighway, St. Louis, Mo.
Olsen, Axel K., 230 N. Broad St., Philadelphia 2, Pa.
Ordway, Mabel D., 6 Parley Vale, Jamaica Plains, Boston, Mass.
Ornsteen, A. M., 2007 Delancey Place, Philadelphia, Pa.
Osborne, Raymond L., 140 E. 54th St., New York 22, N. Y.
Osler, Geoffrey F., 115 East 92nd St., New York 28, N. Y.
Osserman, H. A., 975 Park Ave., New York, N. Y.
Ostow, Mortimer, 50 East 78th Street, New York 21, N. Y.

Pacella, Bernard L., 563 Park Ave., New York 21, N. Y.
Page, W. Randolph, 4900 St. Charles Ave., New Orleans 15, La.
Palmer, Edwin J., 1102 S. Jefferson St., Roanoke, Va.
Papez, James W., 1960 W. Broad St., Columbus 15, Ohio
Parsons, Frederick W., 10 Park Ave., New York 16, N. Y
Parsons, V. Earl Jr., 1719 Broadway, Little Rock, Ark.
Pasamanick, Benjamin, Johns Hopkins School of Hygiene, Baltimore 5, Md.
Pasternak, Maxwell, 210 Prospect St., New Haven, Conn.
Patry, Frederick L., 218 State St., Albany, N. Y.
Patterson, Ralph M., Ohio State University College of Medicine, Columbus 10, Ohio
Pauncz, Arpad, V. A. Hospital, Downey, N. Chicago, Ill.
Pearson, Manuel M., 111 N. 49th St., Philadelphia 39, Pa.
Penfield, Wilder, 3801 University St., Montreal, Canada
Pennes, Harry H., 722 West 168th St., New York 32, N. Y.
Perkins, Orman, 829 Carroll St., Brooklyn 15, N. Y.
Peterman, M. G., 411 E. Mason St., Milwaukee 2, Wis.
Peterson, Arthur L., 111 N. 49th St., Philadelphia 39, Pa.
Pfeiffer, John B. Jr., Duke University School of Medicine, Durham, N. C.
Pietri, Raul, 700 West 168th St., New York 32, N. Y.
Pisetsky, Joseph E., 2664 Grand Concourse, New York 58, N. Y.
Pollock, Lewis J., 122 S. Michigan Ave., Chicago, Ill.
Pool, J. Lawrence, 710 West 168th St., New York 32, N. Y.
Pope, Alfred, Longwood Towers, Brookline 46, Mass.
Putnam, Tracy J., 450 N. Bedford Drive, Beverly Hills, Calif.

Rabiner, A. M., 890 Park Place, Brooklyn, N. Y.
Rackow, Leon L., F.D.R. Veterans Hospital, Montrose, N. Y.
Rado, Sandor, 50 East 78th St., New York 21, N. Y.
Raines, G. N., 119 Aspen St., Chevy Chase 15, Md.
Rand, Carl W., 523 West 6th St., Los Angeles 14, Calif.
Ransohoff, Joseph, 126 Ritchie Drive, Yonkers, N. Y.
Ranson, Stephen W., Neuropsychiatric Consultants Division, Office of Surgeon General, Washington, D. C.
Raphael, Theophile, University of Michigan, Ann Arbor, Mich.
Ray, Bronson S., 525 East 68th St., New York 21, N. Y.
Reback, Samuel, 555 Park Ave., New York 21, N. Y.
Reese, Hans H., Shorewood Hills, Madison, Wis.
Reznikoff, Leon, 175 Riverside Drive, New York 24, N. Y.
Rheinberger, Margaret B., 1259 Old Mill Road, Lake Forest, Ill.
Richardson, Horace K., 11 East Chase St., Baltimore, Md.

Richardson, J. Clifford, 170 St. George St., Toronto, Canada
Richardson, Roy B., 64 Wellesley St. East, Toronto, Canada
Richter, Curt, Johns Hopkins Medical School, Baltimore 5, Md.
Riley, Henry A., 117 East 72nd St., New York 21, N. Y.
Rinkel, Max, 479 Commonwealth Ave., Boston 15, Mass.
Rioch, David McK., Neuropsychiatry Division, A.M.S.G.S., Army Medical Center, Washington 12, D. C.
Rivers, Thurston D., 750 Park Ave., New York, N. Y.
Robie, Theodore R., 144 Harrison St., East Orange, N. J.
Robinson, Franklin, 333 Cedar St., New Haven 11, Conn.
Rodis, Isadore, 1726 Eye Street N.W., Washington 6, D. C.
Rome, Howard P., 622 5th St. S.W., Rochester, Minn.
Rose, Augustus S., University of California Medical Center, Los Angeles 24, Calif.
Roseman, Ephraim, 323 E. Chestnut St., Louisville 2, Ky.
Rosenbaum, Milton, Cincinnati General Hospital, Cincinnati 29, Ohio
Rosenberg, Seymour J., 1801 K Street N.W., Washington 6, D. C.
Ross, Alexander T., Indiana University Medical Center, Indianapolis, Ind.
Rothschild, Karl, 149 Livingston Ave., New Brunswick, N. J.
Rottersman, William, The Menninger Foundation, Topeka, Kan.
Royer, J. Elliott, P.O. Box 935, Oakland 4, Calif.
Rubin, Sidney, 1829 Randolph, Topeka, Kan.
Ruesch, Jurgen, 1st Ave. & Parnassus, San Francisco 22, Calif.
Rupp, Charles, 133 S. 36th St., Philadelphia, Pa.
Russel, Colin, 814 Medical Arts Bldg., Sherbrooke St. W., Montreal, Canada

Sagebiel, James L., 229 Schenck Ave., Dayton 9, Ohio
Salmon, Leon A., 700 West 168th St., New York 32, N. Y.
Sands, Irving J., 202 New York Ave., Brooklyn 16, N. Y.
Saslow, George, 640 S. Kingshighway, St. Louis 10, Mo.
Savitsky, Nathan, 1882 Grand Concourse, Bronx 57, N. Y.
Sawyer, Carl W., White Oak Farm, Marion, Ohio
Scarff, John E., 710 West 168th St., New York 32, N. Y.
Schaller, Walter F., 909 Hyde St., San Francisco 9, Calif.
Scharf, John H., 555 Park Ave., New York 21, N. Y.
Scheinker, I. Mark, 1106 Cross Lane, Cincinnati 6, Ohio
Schlesinger, Edward B., 710 West 168th St., New York 32, N. Y.
Schlezinger, Nathan S., 255 S. 17th St., Philadelphia, Pa.
Schneider, Richard C., University Hospital, Ann Arbor, Mich.
Schnitker, Max T., 425 Jefferson Ave., Toledo 4, Ohio
Schumacher, George A., 59 Bilodeau Court, Burlington, Vt.
Schwab, Robert S., Massachusetts General Hospital, Boston, Mass.
Schwade, Edward D., 324 E. Wisconsin Ave., Milwaukee, Wis.
Schwartz, Henry G., 600 S. Kingshighway, St. Louis 10, Mo.
Schwenkenberg, Arthur J., 210 N. Westmoreland Ave., Dallas 11, Tex.
Sciarra, Daniel, 710 West 168th St., New York 32, N. Y.
Scott, Michael, 255 S. 17th St., Philadelphia, Pa.
Scoville, William B., 85 Jefferson St., Hartford, Conn.
Sears, Robert A., 51 Philbrick Rd., Brookline, Mass.
Seliger, Robert V., 2030 Park Ave., Baltimore, Md.
Selverstone, Bertram, 108 Washington Ave., Cambridge, Mass.

Sengstaken, Robert W., 175 Lindberg St., Manhasset, N. Y.
Shapera, William, 1204 Clark Bldg., Pittsburgh, Pa.
Sharp, Edward A., 81 Linwood Ave., Buffalo, N. Y.
Sharp, Lewis I., 840 Park Ave., New York 21, N. Y.
Shenkin, Henry A., 255 S. 17th St., Philadelphia 3, Pa.
Shenkman, Samuel, 67 East 78th St., New York 21, N. Y.
Shield, James A., 212 W. Franklin St., Richmond 20, Va.
Siegal, Lewis J., 211 East 35th St., New York 16, N. Y.
Silbermann, Maximilian, 893 Park Ave., New York 21, N. Y.
Silverman, Daniel, 269 S. 19th St., Philadelphia 3, Pa.
Silverstein, Alexander, 2114 Pine St., Philadelphia, Pa.
Simms, Leon M., 1187 Ocean Ave., Brooklyn 30, N. Y.
Simon, Benjamin, 163 Hillside Ave., Arlington Heights, Mass.
Simon, John L., 853 Seventh Ave., New York 19, N. Y.
Simons, Donald J., 772 Park Ave., New York 21, N. Y.
Siris, Joseph H., 61–34 188th St., Flushing, L. I., N. Y.
Skoog, A. L., Rialto Bldg., Kansas City, Mo.
Smith, Lauren H., 111 N. 49th St., Philadelphia, Pa.
Sohler, Theodore, V. A. Hospital, Newington 11, Conn.
Solomon, Alfred P., 30 N. Michigan Ave., Chicago, Ill.
Solomon, Harry C., 74 Fenwood Road, Boston 15, Mass.
Solomon, Meyer, 25 E. Washington St., Chicago 2, Ill.
Sorrel, William E., 263 West End Ave., New York 23, N. Y.
Spence, William T., 1150 Connecticut Ave. N.W., Washington 6, D. C.
Spiegel, Ernest A., Temple University Medical School, Philadelphia, Pa.
Spotnitz, Hyman, 41 Central Park West, New York 23, N. Y.
Spottswood, Maurice D., 450 Sutter St., San Francisco, Calif.
Sprofkin, Bertram E., Vanderbilt University Hospital, Nashville 4, Tenn.
Staley, Robert W., 538 Medical Arts Bldg., Pittsburgh 13, Pa.
Starbuck, Helen L., 384 Post St., San Francisco, Calif.
Steelman, Harry F., 1300 University Ave., Madison 6, Wis.
Stellar, Stanley, 180 East 64th St., New York 21, N. Y.
Stephenson, Charles W., South Hero, Vt.
Stern, Frederick D., 671 West 162nd St., New York 32, N. Y.
Stern, Morton M., 24 Girard Place, Newark 8, N. J.
Stevenson, Lewis, 410 East 57th St., New York 22, N. Y.
Stokes, Aldwyn, University of Toronto, 2 Surrey Place, Toronto 5, Canada
Stone, Simon, 753 Chestnut St., Manchester, N. H.
Stookey, Byron, 700 West 168th St., New York 32, N. Y.
Stowell, Averill, 2107 East 23rd St., Tulsa, Oklahoma
Strauss, Hans, 315 Central Park West, New York 24, N. Y.
Strauss, Israel, 116 West 59th St., New York 19, N. Y.
Strecker, Edward A., 111 N. 49th St., Philadelphia, Pa.
Stuck, Ralph, 632 Republic Bldg., Denver 2, Colo.
Suckle, Henry, 414 Tenney Bldg., Madison, Wis.
Sutt, Robert B., Duke University, Durham, N. C.
Summers, David C., V.A. Hospital, Montrose, N. Y.
Swain, Richard D., 211 Roseville Ave., Newark, N. J.
Sweet, William H., 35 Chestnut Place, Brookline 46, Mass

Teahan, John W., 689 Asylum Ave., Hartford, Conn.
Teitelbaum, Michael H., 700 West 168th St., New York 32, N. Y.
Terhune, William B., Silver Hill Foundation, New Canaan, Conn.
Therman, Per Olof, 111 N. 49th St., Philadelphia 39, Pa.
Thompson, George N., 1136 West 6th St., Los Angeles 14, Calif.
Thompson, Lloyd J., Bowman Gray School of Medicine, Winston-Salem, N. C.
Thorner, Melvin W., 281 Brookway, Merion, Pa.
Tice, William P., 203 Carlton Terrace Bldg., Roanoke, Va.
Tietz, Esther Bogen, 544 S. Mariposa Ave., Los Angeles 5, Calif.
Tiffany, William J., 160 East 48th St., New York 17, N. Y.
Tissenbaum, Morris J., 63 Cutter Mill Road, Great Neck, N. Y.
Tornay, Anthony S., 37 S. 20th St., Philadelphia 3, Pa.
Trawick, John D. Jr., Heyburn Bldg., Louisville 2, Ky.
Tureen, Louis L., 457 N. Kingshighway, St. Louis, Mo.
Turner, Oscar A., 2204 Glenwood Ave., Youngstown, Ohio
Turner, William J., 431 New York Ave., Huntington, N. Y.

VanEpps, Clarence E., University Hospital, Iowa City, Iowa
VanWart, Roy, 10431 Bellegin Road, Los Angeles 24, Calif.
Vibber, Foster L., 27 Elm St., Worcester, Mass.
Vicale, Carmine T., 710 West 168th St., New York 32, N. Y.
Victoroff, Victor M., 10528 Park Lane, Cleveland 6, Ohio
Viets, Henry, 20 Gloucester St., Boston 15, Mass.
Vinciguerra, Michael, 604 Westminister Ave., Elizabeth, N. J.
von Storch, Theodore J. C., Montefiore Hospital, Gun Hill Road, Bronx 67, N. Y.
Voris, Harold C., 30 N. Michigan Ave., Chicago 2, Ill.

Wadsworth, Richard C., 86 Grove St., Bangor, Maine
Waggoner, Raymond W., University Hospital, Ann Arbor, Mich.
Walker, A. Earl, 601 N. Broadway, Baltimore 5, Md.
Wall, James H., 121 Westchester Ave., White Plains, N. Y.
Wallace, Louis O. S., 119 Hall St., Manchester, N. H.
Ward, Arthur A. Jr., University of Washington School of Medicine, Seattle 5, Wash.
Warfel, Martin C., 501 Commerce Bldg., Erie, Pa.
Warner, Francis J., P.O. Box 203, Warren, Pa.
Watson, James, 2236 Carabel Ave., Lakewood 7, Ohio
Watson, Robert, Donaghey Bldg., Little Rock, Ark.
Watts, James W., 1911 R Street N.W., Washington, D. C.
Wechsler, I. S., 70 East 83rd St., New York 28, N. Y.
Weickhardt, George D., St. Elizabeth's Hospital, Washington 25, D. C.
Weil, Andre A., 322 Osborn Bldg., 1020 Huron Road, Cleveland 15, Ohio
Weil, Arthur, 115 06 Park Lane S., Kew Gardens, N. Y.
Weinberg, Max H., West Penn Hospital, Pittsburgh 24, Pa.
Weisman, Avery D., 464 Beacon St., Boston, Mass.
Weiss, Deso A., 115 East 86th St., New York 28, N. Y.
Wender, Louis, 59 East 79th St., New York 21, N. Y.
Wermuth, William C., 111 N. 49th St., Philadelphia 39, Pa.
Wexler, Daniel, 38 Grove St., New Bedford, Mass.
Whitaker, Carl A., Emory University, Atlanta, Ga.

Whitcomb, Benjamin B., 85 Jefferson St., Hartford, Conn.
White, D. Naldrett, Kingston General Hospital, Kingston, Ontario, Canada
Whitehorn, John C., Johns Hopkins Hospital, Baltimore 5, Md.
Wholey, Cornelius C., 121 University Place, Pittsburgh, Pa.
Wiedman, Otto G., 85 Jefferson St., Hartford 6, Conn.
Wikler, Abraham, U. S. Public Health Service Hospital, Lexington, Ky.
Williams, Ernest Y., 1747 First St. N.W., Washington, D. C.
Williams, Harold W., 129 Waterman St., Providence, R. I.
Williams, Ward, 274 Alexander St., Rochester 7, N. Y.
Wilson, David C., University of Virginia, Charlottesville, Va.
Winkelman, Nathaniel W., 1911 Spruce St., Philadelphia, Pa.
Witt, Samuel E., 745 Fifth Ave., New York 22, N. Y.
Wittson, Cecil L., 415 N. 61st St., Omaha, Neb.
Wolf, Abner, 630 West 168th St., New York 32, N. Y.
Wolff, Harold G., 525 East 68th St., New York 21, N. Y.
Woltman, Henry W., Mayo Clinic, Rochester, Minn.
Woodall, J. Martin, 990 Centre St., Boston 30, Mass.
Woolley, Lawrence F., 490 Peachtree St. N.E., Atlanta, Ga.
Wortis, S. Bernard, 410 East 57th St., New York 22, N. Y.
Wycis, Henry T., 3401 N. Broad St., Philadelphia 40, Pa.

Yahr, Melvin D., 710 West 168th St., New York 32, N. Y.
Yakovlev, Paul I., 25 Shattuck St., Boston 15, Mass.
Yaskin, Joseph, 1832 Spruce St., Philadelphia, Pa.
Yorshis, Morris, 281 Haverhill St., Lawrence, Mass.

Zabriskie, Edwin G., 115 East 61st St., New York 21, N. Y.
Zeifert, Mark, 304 N. Fulton St., Fresno, Calif.
Zeligs, Meyer A., 450 Sutter St., San Francisco, Calif.
Zfass, Isadore S., 2502 Monument Ave., Richmond, Va.
Ziegler, Dewey K., 74 Fenwood Road, Boston, Mass.
Zilboorg, Gregory, 33 East 70th St., New York 21, N. Y.
Zimmerman, Frederick T., 700 West 168th St., New York 32, N. Y.
Zimmerman, Harry M., Montefiore Hospital, Gun Hill Road, Bronx 67, N. Y.
Zimmerman, Joseph, 53 Eighth Ave., Brooklyn 17, N. Y.

INDEX

ACTH, in provocation of psychologic responses, 273
  in treatment of alcoholism, 288
Adrenocorticotropic hormone *see* ACTH
Alcoholic, chronic, definition of, 287
Alcoholism, ACTH in treatment of, 288
  antabuse in treatment of, 288, 289
  conditioned aversion therapy, 291
  drugs in treatment of, 287
  nutritional therapy, 292
  relation of emotions and biochemical changes, 292
Alexander, Franz: Principles and techniques of briefer psychotherapeutic procedures, 16
Amador, Luis *see* Percival Bailey
Antabuse, in treatment of alcoholism, 288, 289
Anti-epileptic drugs, in treatment of behavior disorders, 295
Appel, Kenneth E., 40
  see Harvey, William A.
  Lhamon, William T., Myers, J. Martin, and Harvey, William A.: Long term psychotherapy, 21
Associations, controlled, and hypnotherapy, 152
Automatic writing, and hypnotherapy, 152
Aversion therapy, conditioned, in alcoholism, 291

Bailey, Percival, John R. Green, Luis Amador and Frederic A. Gibbs: Treatment of psychomotor states by anterior temporal lobectomy, 341
Behavior, changes in maturity of, 108
  disorders, anti-epileptic drugs in treatment of, 295
Berle, Beatrice B., Ruth H. Pinsky, Stewart Wolf, and Harold G. Wolff: Appraisal of the results of treatment in stress disorders, 167
Blood pressure, fall following mecholyl, 331
  resting systolic, effect of lobotomy on, 330
  response, to mechoyl, effect of lobotomy on, 328
Bonner, Frances, Stanley Cobb, William H. Sweet and James C. White: Frontal lobe surgery. Its value in the treatment of pain with consideration of postoperative psychological changes, 392
Braceland, Francis J., 306
  see Howard P. Rome
  Summary of papers, 267
Brain disease, organic, electroshock therapy in, 235
Brosin, Henry Walter, 116, 187

Cameron, D. Ewen, 37
  Summary of papers, 301
Carbon dioxide inhalation therapy *see* inhalation therapy
Chesnut Lodge Sanitarium, studies in milieu therapy at, 96
Child guidance, psychotherapeutic aims, 131
  psychotherapeutic methods, 133
  programs, evaluation of therapy, 131
Child psychiatry, milieu therapy in, 98
  research needs in field of, 137
  results of, 131
Children, lobotomy in, evaluation, 311
Cingulate cortex isolation, for treatment of psychoneuroses, 374
  for treatment of psychoses, 374
  operative procedure, 375
Client-centered therapy, research program in 106
Cobb, Stanley *see* Frances Bonner
Colitis, ulcerative, psychotherapy for, 176
Complaint inventory, 382
Cortisone, role in provocation of psychologic responses, 273
Counselor-boy relationships, evaluating, delinquency prevention program, 140
Culture change, and psychologic stress, 64

Delinquency prevention program, evaluating counselor-boy relationships, 140
evaluating outcome, 139
evaluating therapy in, 138
procedures, 138
Depression, and electroshock therapy, 232
Diethelm, Oskar, 37, 189, 272
see Mary Jane Sherfey
Drinker, excessive, 287
Drugs, anti-epileptic, in treatment of behavior disorders, 295
in treatment of alcoholism, 287
narcoanalytic use of, 239
Dunsmore, R. H. *see* W. B. Scoville

Ego, basic functions of, 17
neurotic defenses, 18
Electric convulsive therapy *see* Electroshock therapy
Electroshock therapy, animal experimentation, 220
barbiturates and, 237
blurring as side effect of, 237
clinical evaluation of, 232
complications with, 238
convulsive current, analytical studies of, 200
effect of each stimulus, 204
frequency of repetition, 205
total energy requirement, 208
total stimulation time, 207
treatment time, 207
correlation of parameters of electric current with physiologic and psychologic changes in, 199
current evaluation of, 199
depressions and, 232
EEG changes, 215
establishing rational techniques of, 223
euphorization as side effect of, 237
fear reaction, 217
in epilepsy, 236
in organic brain disease, 235
in schizophrenia, 234
in the psychoneuroses, 236
in manic-depressive psychosis, 233
instruments, 225
intelligence tests, 216
memory tests, 216
methods of stimulation, 223
prognosis by blood pressure grouping, 251
side effects, 238
stimulation, convulsive reaction, 211
delayed psychophysiological changes, 215
post-convulsive period, 212
psychophysiological effects of, 209
synthesis, search for a, 219
Ephedrine derivatives, short-term psychotherapy with, 242
Epilepsy, electroshock therapy and, 236
Evaluation of therapy, classical technique, 51
criteria for, 11
design for, 10
electroshock therapy, 199
group treatment, 129
improving, 12
in child guidance systems, 131
in delinquency prevention program, 138
in group psychotherapy, 124
in stress disorders, 167
insulin, 193
lobotomy, 319
long-term follow-up studies, 13, 14
methods of, with children, 134
practical criteria, 23
prognostic tests for, 245
see also Prognostic tests

Frank, Jerome D., 149
Areas of research in group psychotherapy, 119
Freed, H. *see* E. A. Spiegel
Freeman, Walter *see* Jonathan M. Williams
Freud, conception of psychoanalytic treatment, 49
parentifying treatment behavior, 49
Freund, Henry, 428
Frontal lobe surgery, for treatment of pain, 392
Function, executive, of ego, 18
integrative, of ego, 18
Funkenstein, Daniel H., Milton Greenblatt and Harry C. Solomon: Prognostic tests indicating the effectiveness of treatment, 245

Gardner, George E., 149
Evaluation of therapeutic results in child guidance programs, 131
Garrison's anxiety, 382

Gibbs, Frederic A., 372, 373
see Percival Bailey
Goals, therapeutic, and their significance for therapeutic strategy, 3
Green, John R. *see* Percival Bailey
Greenblatt, Milton *see* Daniel H. Funkenstein
see Harry C. Solomon
Group psychotherapy, areas of research in, 119
classification of patients, 119
clinical applications of, 127
dynamics of, 127
evaluation of therapy, 124, 129
forms of resistance in, 128
multiplicity of transferences in, 129
processes of therapy, 123
therapist in, 121

Hadden, Samuel B., 149
Dynamics and clinical applications of group psychotherapy, 127
Henry, C. E. *see* W. B. Scoville
Herman, Morris: Summary of papers, 185
Higgins, John *see* Milton Rosenbaum
Hoch, Paul H., 117, 272, 305, 372
Evaluation of newer pharmacodynamic therapies, Including the narcoanalytic use of drugs, 239
Holsopple, James Q., 372
see Richard L. Jenkins
Hughes, Joseph, 272
Current evaluation of insulin therapies, 193
Hydrocortisone, role in provocation of psychologic responses, 273
Hyperkinesia, destructive, effect of lobotomy on, 316
Hypnoid therapy, 47
at magic-craving level, 47
at parentifying level, 48
Hypnosis, critical evaluation of, 151
Hypnotherapeutic techniques, 151
Hypnotherapeutics *see* Hypnotherapy
Hypnotherapy, 44
advantages of, 153
cathartic technique, modifying, 45
critical evaluation, 151
field of application, 151
prohibitive technique, modifying, 45
precautions in, 153
priming in, 44
problems of, 153
Hypothalamotomy, changes induced by, 387
for treatment of psychoses, 379
operative technic, 387

Inhalation therapy, 280
in manic-depressive, 283
motor phenomena during, 281
results of, 282
technic for, 280
Insulin therapy, clinical results, 193
combined with electroshock therapy, 196
current evaluation, 193
deep coma, 195
factors having prognostic significance in, 195
follow-up studies, 194
for schizophrenia, 197

Jackman, Abraham L., 307
see L. J. Meduna
Jenkins, Richard L., and James Q. Holsopple: Criteria and experimental design for evaluating results of lobotomy, 319

Kalinowsky, Lothar B., 38, 270, 305
clinical evaluation of electric convulsive therapy, 232
Leucotomies, bilateral frontal, 398
bilateral lower quadrant, 399
unilateral, 402
Leucotomy, bifrontal, for treatment of pain, 392
bilateral, of Freeman and Watts, 394
frontal, psychological observations following, 405
lower quadrant frontal, 396
lower quadrant frontal, psychological observations following, 409
theories concerning, 416
unilateral, effect on speech, 414
frontal of Scarff, 400
frontal, psychological observations following, 410
Levine, Maurice, 117
Summary of papers, 35
Levy, David M.: Summary of papers, 148
Lhamon, William T. *see* Appel, Kenneth E.

Liberson, W. T., 271
Current evaluation of electric convulsive therapy. Correlation of the parameters of electric current with physiologic and psychologic changes, 199
see W. B. Scoville
Lidz, Theodore, 188
Principles and techniques of therapy in psychosomatic disorders, 156
Livingston, Kenneth E., 429
Cingulate cortex isolation for the treatment of psychoses and psychoneuroses, 374
Lobectomy, anterior temporal, treatment of psychomotor states by, 341
Lobotomy, changes in physiological variables in relation to clinical outcome following, 333
changes in physiological variables of specific autonomic groups following, 334
clinical outcome of autonomic groups following, 336
effect on blood pressure response to mecholyl, 328
effect on destructive hyperkinesia, 316
effect on resting systolic blood pressure, 330
evaluating results of, criteria and experimental design for, 319
in children, evaluation of, 311
follow-up, 312, 313
medial temporal, case selection for, 349
effect on ECG, 364
effect on EEG's, 366
effect on epileptic seizures, 366
in treatment of psychotic states, 347
literature on, 347
neurologic changes following, 361
operative results, 361
operative technique, 349, 353
psychiatric changes following, 361
physiologic changes following, 364
results following, 356
types of operations, 348
orbito-temporal, operative technique, 354
results following, 360
overall changes in physiological variables following, 330
physiological changes predictive of clinical outcome following, 328
preoperative physiological status, relationship to clinical outcome following, 332
type of, changes in physiological variables in relation to, 337

Magic-craving level, priming and modifying, 47
Maladjustment, and families, 66
Manic-depressive psychosis, electroshock therapy in, 233
Manic-depressives, inhalation therapy for, 283
Mecholyl, blood pressure fall following, 331
effect of lobotomy on blood pressure response to, 328
Meduna, L. J. and A. I. Jackman: Carbon dioxide inhalation therapy, 280
Menninger Clinic, studies in milieu therapy at, 97
Mental disease, social factors in prevention of, 84
Merritt, H. Houston: Anti-epileptic drugs in the treatment of behavior disorders, 295
Milieu therapy, 94
in child psychiatry, 98
investigations of, 101
studies in, at Chesnut Lodge Sanitarium, 96
at Menninger Clinic, 97
at Pioneer House, 100
at Sheppard and Enoch Pratt Hospital, 95
Modifying, in adaptational technique of psychoanalytic therapy, 54
in classical psychoanalytic therapy, 50
Muncie, Wendell, 189
Factors influencing the effectiveness of treatment in private practise of psychiatry, 178
Myers, J. Martin *see* Appel, Kenneth E.

Narcoanalytic use of drugs, 239
sodium amytal, 239
Narcocatharsis, 241
Narcosuggestion, 240
Narcotherapy, for short-term psychotherapy, 241
"Neighbor groups," 102
Neurologists, obituaries of, 68
Nutritional therapy, in alcoholism, 292

Orbital cortex, bilateral excision of, 401
removal of, 406
unilateral excision, 401
Orchinik, C. *see* E. A. Spiegel

Pain, bifrontal leucotomy for treatment of, 392
frontal lobe surgery for treatment of, 392
Parameters of electric current, correlation with physiologic and psychologic changes, 199
Patients, parental constellation, 66
Pepe, A. *see* W. B. Scoville
Perception, as ego function, 17
Personality, of psychiatrists, 67
Personnel-patient matrix, 101
Pharmacodynamic therapy, evaluation of, 239
with benzedrine, 243
with dexedrine, 243
with dibenamine, 244
with ephedrine derivatives, 242
with d-LSD25, 243
with mescaline, 243
with pervitin, 243
with tolserol, 244
Pinsky, Ruth H. *see* Beatrice B. Berle
Pioneer House, milieu therapy at, 100
Pool, J. Lawrence, 270
summary of papers, 422
Powers, Edwin *see* Teuber, Hans-Lukas
Priming, in adaptational technique of psychoanalytic therapy, 53
in classical psychoanalytic therapy, 49
in hypnotherapy, 44
Prognostic tests, administration of, 246
blood pressure grouping, diagnostic categories and clinical outcome, 251
clinical outcome and mathematical measures, 252
drug-precipitated anxiety, 256
electroshock therapy and blood pressure grouping, 251
indicating effectiveness of treatment, 245
measures, 247
blood pressure groups, 247
diagnostic and prognostic, 250
mathematical, 249
method, 246
subjects, 246
precipitable anxiety, 250
reliability studies, 253
results of, 251
type of psychophysiological response, 250
Psychiatric team, development of, 97
Psychiatric thinking, concerning environment, 60
concerning individual, 60
social considerations, 60
Psychiatrists, obituaries of, 68
personality of, 67
Psychiatry, knowledge in, desirable additions in, 32
relative status, 32
private practice of, factors influencing effectiveness of, 178
Psychoanalytic therapy, adaptational technique, 52
adaptational technique, modifying in, 54
priming in, 53
classical technique, 48
modifying in, 50
priming in, 49
Freud's conception, 48
Psychodynamics, in psychotherapy, 31
Psychologic responses, role of ACTH, cortisone, and hydrocortisone in provocation of, 273
Psychomotor states, treatment by anterior temporal lobectomy, 341
Psychoneuroses, electroshock therapy in, 236
physiological theory of, 285
treatment of, results, 25
"Psycho-penetration," 284
Psychosomatic disorders, principles and techniques of therapy in, 156
Psychosomatic medicine, environmental stress, 164
functional and structural changes, 161
goals of treatment in, 160
psychological formulation of patient's personality structure, 162
role of physician in, 164
Psychotherapy, approaches, results from differing, 27
common denominators, 28
definition of, 21
duration, factors influencing, 22
experience, bare essentials, 29
goals, 21
factors influencing, 22
group *see* Group psychotherapy

Psychotherapy (*cont'd*)
long term, 21
methods, classification of, 16
lineage of, 44, 45
patient selection, 26
procedures, briefer, principles and techniques of, 16
supportive, 17
uncovering, 17
psychodynamics in, 31
reports of results, 24
short-term, narcotherapy for, 241
treatment selection, 26
Psychotic states, medial temporal lobotomy in treatment of, 347
uncotomy in treatment of, 347

Rado, Sandor: Recent advances of psychoanalytic therapy, 42
Reiser, Morton F. *see* Milton Rosenbaum
Relativism, brought about by culture change, 74
Research, in psychotherapy, criterion for, 112
Rioch, David McK. and Stanton, Alfred H.: Milieu therapy, 94
Rogers, Carl R., 118
A research program in client-centered therapy, 106
Romano, John, 269, 306
Summary of papers, 114
Rome, Howard P. and Francis J. Braceland: The role of ACTH, cortisone, and hydrocortisone in the provocation of certain psychologic responses, 273
Rosenbaum, Milton, 187
Morton F. Reiser and John Higgins: Setting goals of treatment in psychosomatic medicine, 160
Ruesch, Jurgen, 117
social factors in therapy. A brief review, 59
Schizophrenia, electroshock therapy in, 234
insulin therapy for, 197
Schizophrenias, treatments of, results, 25
Schneck, Jerome B.: Critical evaluation of hypnosis, 151
Schneck, Jerome M., 188
Scotomization, 18
Scoville, W. B., 373
R. H. Dunsmore, W. T. Liberson, C. E. Henry and A. Pepe: Observations on medial temporal lobotomy and uncotomy in the treatment of psychotic states, 347
Self, changes in perceived, 108
Sherfey, Mary Jane, and Oskar Diethelm: Evaluation of drugs in the treatment of alcoholism, 287
Sheppard and Enoch Pratt Hospital, milieu therapy studies in, 95
Sodium amytal, interview technique, 240
narcoanalytic use of, 239
short-term psychotherapy with, 242
Sodium pentothal, narcoanalytic use of, 240
Solomon, Harry C. *see* Daniel H. Funkenstein and Milton Greenblatt: Physiological changes predictive of clinical outcome following frontal lobe surgery. Effect of frontal lobe surgery upon systolic blood pressure response to mecholyl, 328
Spiegel, E. A., 428
H. T. Wycis, H. Freed and C. Orchinik: Thalamotomy and hypothalamotomy for the treatment of psychoses, 379
Staff-staff inter-relations, 101
Strategy, therapeutic, therapeutic goals and, 3
Stress disorder treatment, 167
follow-up, 177
materials and methods, 167
patient appraisal, 170
results of, 172
technic of, 168
Stress disorders, evaluating therapy in, 167
Sweet, William H. *see* Frances Bonner

Tetraethylthiuramdisulphide *see* Antabuse
Teuber, Hans-Lukas, 150
and Edwin Powers: Evaluating therapy in a delinquency prevention program, 138
Thalamotomy, changes in Rorschach test induced by, 383
for treatment of psychoses, 379
post-operative check, 381
Therapeutic strategy, 3
Therapy, and culture change, 64
as function of communication, 75
as function of culture, 72
as function of doctors, 67
as function of individual doctor, 62
as function of individual patient, 61

as function of patient-groups, 63
as interaction phenomenon, 70
carbon dioxide inhalation *see* Inhalation therapy
changes in perceived self as concomitant of, 108
changes in social reality during, 76
client-centered, population of experiment in, 109
  problem of data collection, 110
  program design, 106
  research program in, 106
  type of finding in, 110
concept of health, 73
evaluation of *see* Evaluation of therapy, 10
factors influencing effectiveness of, in private practice of psychiatry, 178
global personality change in, 107
hypnoid, 47
in psychosomatic disorders, principles and techniques of, 156
insulin *see* Insulin therapy
milieu *see* Milieu therapy
patient's designs for co-operation, 43
pharmacodynamic *see* Pharmacodynamic therapy
psychoanalytic, conceptual scheme, 42
  recent advances of, 42
social considerations in practice of, 76
social factors in, 59
with members of different religious groups, 80
with members of different social classes, 79
with non-identified persons, 82
  with non-white races, 78
  with offenders of the law, 82
  with political radicals, 81
  with white immigrants, 76
Transference, terms and meaning, 49

Uncotomy, in treatment of psychotic states, 347
  operative technique, 351
  results following, 354

Visual imagery, and hypnotherapy, 152

Walker, A. Earl, 271, 427
  summary of papers, 370
White, James C., 426
  see Frances Bonner
Whitehorn, John C., 39
  Therapeutic goals and their significance for therapeutic strategy, 3
Williams, Jonathan M., 372
  and Walter Freeman: Evaluation of lobotomy with special reference to children, 311
Word-association procedures, and hypnotherapy, 152
Wolf, Stewart, 189
  see Beatrice B. Berle
Wolff, Harold G. *see* Beatrice B. Berle
Wortis, S. Bernard, 270, 308
Wycis, H. T. *see* E. A. Spiegel

Zubin, Joseph, 39
  Design for the evaluation of therapy, 10

Form No. 3.

PSY, RES.L-1

Bureau of Educational & Psychological Research Library.

The book is to be returned within the date stamped last.

.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

WBGP-59/60-5119C-5M

132
WOR
Form No. 4

BOOK CARD

Coll. No..... Accn. No. 981

Author. Worthis, S. B. ed.

Title. Psychiatric treatment.

Date.	Issued to	Returned on

132
WOR